

666

January 1957

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THE MAGAZINE OF
Appliance AND
Metal Products MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

Architects: Perkins & Will, Chicago
 Porcelain Enamel: Ingram-Richardson,
 Beaver Falls, Pa.
 Photographer: Hedrich-Blessing, Chicago

another
ARCHITECTURAL
GEM
 in
PORCELAIN
ENAMEL

with color by *"Ceramic"*

The Lutheran Brotherhood Office Building in Minneapolis is another outstanding example of the architectural potentials of porcelain enamel. In addition to the economies gained by the use of lighter structural members and the saving in installation time, porcelain enamel provides permanently low upkeep and

untarnished freshness.

Architects have found in porcelain enamel a material of almost unlimited versatility in effective applications; and manufacturers have found in "Ceramic" a dependable source of supply for precise color matching and uniformity, and for smooth workability.

C-20



CERAMIC COLOR & CHEMICAL MFG. CO.
New Brighton, Pa., U.S.A.



Porcelain Enamel

Fills Homemakers' demands for High Quality Products

In many households, washers and dryers have moved out of the basement and into the kitchen, recreation room, or other living areas. As a result, housewives want a finish on laundry equipment that's attractive and stays attractive. Nothing meets this requirement better than porcelain enamel.

Porcelain enamel resists damage from ordinary household usage—even the treatment it may get from children's toys. In addition, it won't fade or discolor with age. Soap and water are all that's needed to keep porcelain enamel surfaces sparkling clean. That's why today's homemakers consider this lifetime finish a welcome addition to their furnishings.

A porcelain enamel finish on your products gives you other sales advantages, too: It resists heat, thermal shock and food acids.

* * *

If you do not have facilities for porcelain enameling, write us for the name of an experienced job enamer near

you. You'll find that he can help you work out problems of design and production. You'll find, too, that most job enamers specify Armco Enameling Iron as the base metal for their product. They know that Armco quality is consistently high. That's how it earned its reputation as the "World's Standard Enameling Iron."

Armco Steel Corporation

777 Curtis Street, Middletown, Ohio

- ☐ Send us the name of an experienced job enamer.
☐ Send us your catalog, "Armco Enameling Iron."

We manufacture _____

Name _____

Company _____

Street _____

City _____ Zone _____ State _____

ARMCO STEEL CORPORATION

777 CURTIS STREET, MIDDLETOWN, OHIO

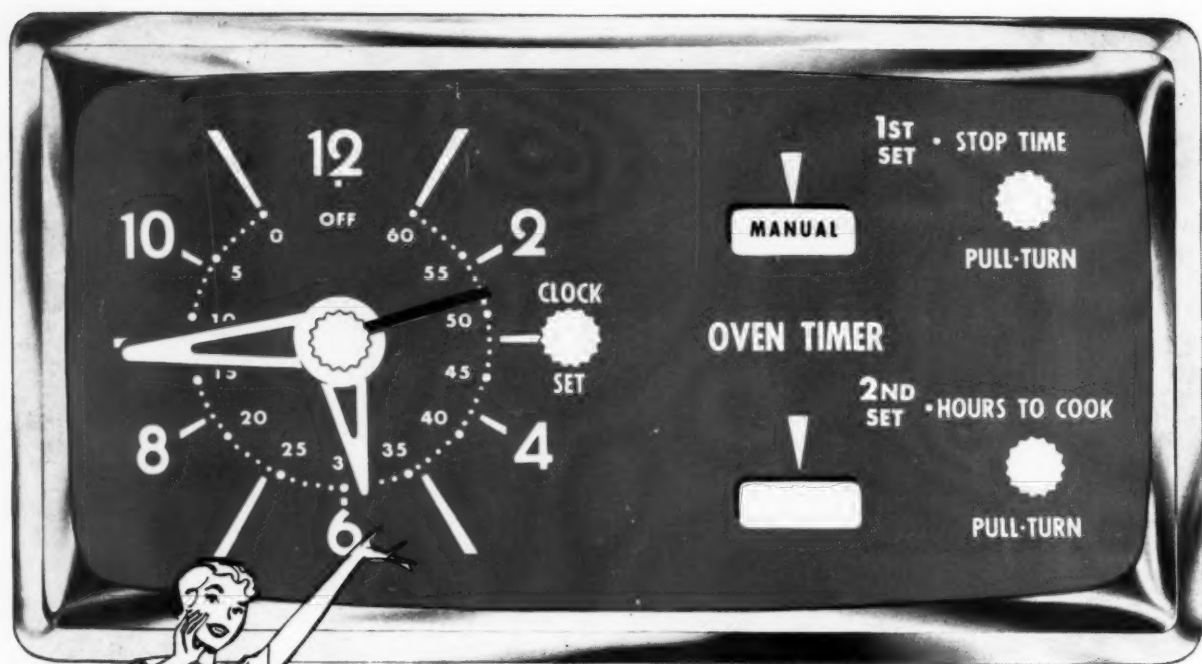
SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

finish JANUARY • 1957



2666,051
F49

NOW... a range timer any salesman can demonstrate--any woman can understand and use



THE EASIEST SETTING AUTOMATIC TIMER EVER DESIGNED!

(Simple instructions are right on the face!)



For the first time, the oven timer has been *completely separated* from the clock, making setting an easy 1-2 operation on the Intermatic Easy-Set Range Timer. Faster, smoother demonstrations create more range sales, and

happier homemakers mean even more! Its clean, simple lines blend perfectly with any style range. Precision engineered throughout, the low cost of this new range timer will come as a pleasant surprise.

Models available for gas and electric ranges . . . with or without interval timer. Can be furnished in any color combination and without bezel if desired.

Send for new 4 color illustrated catalog 17-AA **TODAY**





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RANGE TIMERS

3 FINE INSTRUMENTS IN 1

1. Accurate electrically operated clock
2. Precision electrically operated interval timer
3. Separate, easy-to-understand automatic oven timer can be used for fully automatic or semi-automatic cooking.

INTERNATIONAL REGISTER COMPANY

2614 West Washington Boulevard • Chicago 12, Illinois

January • 1957

VOL. 14 • NO. 1

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MONTHLY TRADE PUBLICATION

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A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is \$8.00 per year, domestic. To all other countries \$10.00 per year (U.S. funds). Single copies, \$1.00.

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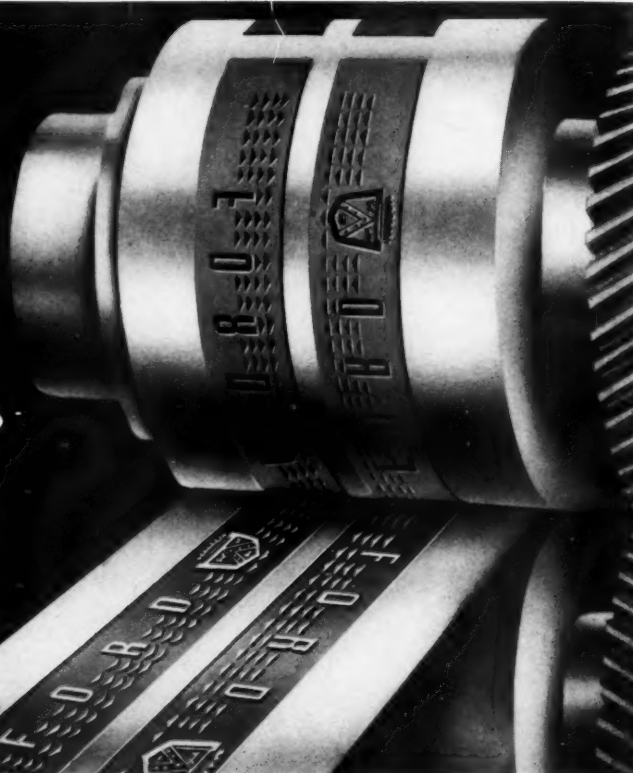
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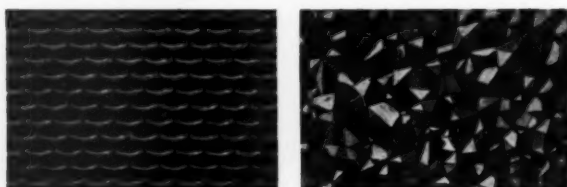
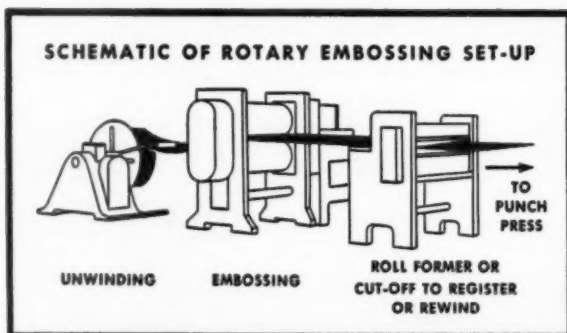
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METAL PRODUCTS MANUFACTURING
FROM RAW METAL TO FINISHED PRODUCT

**INCREASE
PRODUCTION
SPEED
UP to 10 TIMES
AT LITTLE OR NO
EXTRA COST**



with ALCLYDE Matched Hardened Forged Steel Embossing Rolls and Gears



TYPICAL ALL-OVER ALCLYDE PATTERNS



ALCLYDE REGISTER PATTERN

IDEAL FOR SCUFF PLATES • INSTRUMENT PANELS ESCUTCHEON PLATES • DECORATIVE TRIM

Rotary Embossing with Alclyde Matched Hardened Forged Steel Rolls is today's fastest, most versatile method for mass production embossing. Alclyde's Rolls and Equipment assure precision rotary embossing on all sheet and coil metals and a wide range of other materials.

HIGHEST SPEEDS: Design areas which formerly required high pressures and slow cumbersome presses can now be quickly embossed, coined or impressed. The balance of the low pressure forming and drawing may be done by roll formers or high speed small presses. *The entire operation is up to ten-times faster.*

NO-DESIGN LIMITATIONS: Alclyde places no restrictions on design or styling. The most complex patterns may be embossed. Register marks are incorporated for forming die registration and automatic trip dimples for register cut-off.

GREATER VERSATILITY: Alclyde's Matched Steel Rolls can emboss "all-over" or "register" patterns to one or both sides of the material, imparting three dimensional beauty, greater strength and mar-resistance.

Alclyde engineers are pioneers in rotary embossing. A simple request will solve your problem.

Alclyde

Alclyde Engraving Company, Inc.

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MACCO MACHINE CLEANER NO. 71-D

METAL SURFACE
PROTECTED
WITH MACCO
71-D
MACHINE
CLEANER

WITHOUT
71-D
PROTECTION

a phosphate cleaner and rust inhibitor
GIVES BETTER PAINT

A D H E S I O N

**71-D prevents rust spread
and rust blisters**

A MACCO CASE HISTORY*

As in all fields today, purchasers of metal products are constantly demanding more and more in the quality of their paint finishes.

By far the most efficient and economical method of preparing metals for the finest and most enduring paint job is by use of Macco M.C. No. 71-D. Laboratory and shop tests prove that, on steel, cast iron, aluminum or die cast, Macco M.C. No. 71-D provides a corrosion-resistant phosphate coating comparable in quality to that formerly available only through expensive and elaborate methods of preparation.

TESTED ADVANTAGES OF MACCO M.C. No. 71-D CLEANER

1. Cleans soil from metals and etches in one operation.
2. More economical because of longer life of solution.
3. Gives microscopic phosphate coating, greatly aiding in paint adhesion and corrosion resistance.
4. No special equipment required.
5. Never hardens in the drum.
6. Gives excellent protection against rust prior to painting.
7. Simple to control solution.
8. Can be run in conventional one, two, or three stage washers, as well as in other types.

Use Macco M.C. No. 71-D Cleaner and Phosphate Coating and add immeasurable quality to the finish of your product.

*Actual case history, names, etc. can be had by writing today to

LEADING METAL PROCESSORS

indorse its use for ...

- CAMERAS
- TAPE RECORDERS
- TV CABINETS
- LAWN FURNITURE
- APPLIANCES
- MOLDING
- TOYS, Etc.

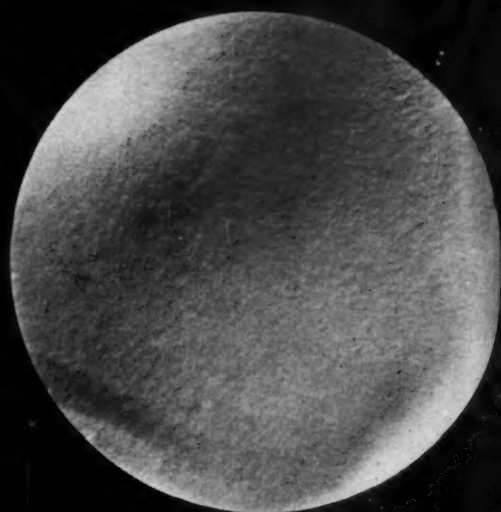
MACCO
PRODUCTS COMPANY

Makers of Better Metal-Working Compounds
Since 1931

9210 SOUTH SANGAMON STREET • CHICAGO 20, ILLINOIS

This is an unretouched photo of a heavy section of broken Coors High Density Alumina Ceramic, used for grinding balls and brick. It was formed by the unique Isostatic Process. Obviously, this ceramic is completely homogenous—with no voids or air pockets, and without drying stress lines. This homogenous structure can be found in products formed by the Isostatic Process used by Coors.

Coors



FOR MAXIMUM GRINDING RESULTS:

your best buy in grinding balls & m

- All Coors High Density Grinding Media and Mill Liner Brick are made by the Isostatic Process which produces these thick sections without voids or air pockets and without internal drying stresses. This means that these Coors products are completely homogenous or uniform in physical structure throughout; also, that they have the same hardness (9 on Moh's Scale) at the center as on the surface. Results: Longer service life in your mill; no chipping or cracking of balls to cause gouging or scratching of the lining; uniform hardness which permits media to retain its shape with smooth surfaces for easy cleaning.

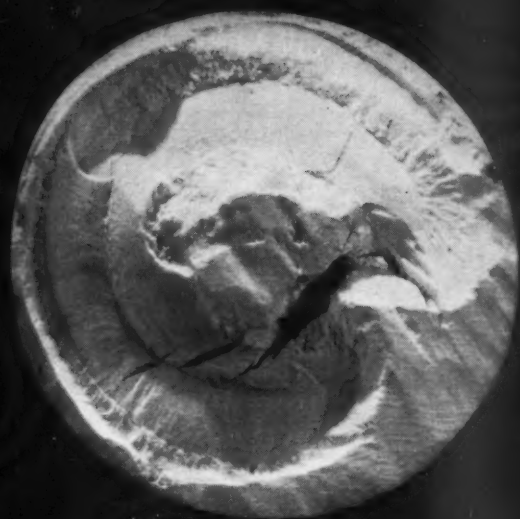
With the Isostatic Process, both Coors High Density Grinding Media and Coors High Density Brick are formed initially by pressing a DRY, unfired alumina powder in a rubber mold, under high hydraulic pressure. This uniform pressure from all directions provides uniform compactness and complete homogeneity. Since the powdered

ceramic material is dry before it is formed into the shape of grinding media or brick, these products go directly from the forming press to the high temperature (2670°F) continuous kilns—thus eliminating the ordinary drying step, necessary in all conventional wet processes.

Before firing, all ceramic products produced by a wet process must be thoroughly dried, whether they are formed by extruding, casting, hand rolling, etc. Obviously, once a wet process product is formed, the outside dries first. This causes hidden drying stress rings to develop. And finally, the volume occupied by the water is replaced by air—forming hidden voids, as you can plainly see in the fractured piece shown above. Hidden drying stresses cause media to break up in your mill. Voids cause uneven wear of media and brick.

Since Coors High Density Grinding Balls and Mill Lining Brick are dry when they

LZP INDUSTRIAL CERAMICS CO., 275 Kalamath St., Denver 23, Colorado • National Sales Representatives for:



This is an unretouched photo of a heavy section of broken high density alumina ceramic. It was formed by a conventional wet process. This ceramic piece illustrates the voids and stress rings caused by differential drying—i.e., drying from the outside in to the center. These inherent imperfections can cause balls to crack, chip and break in the mill, resulting in abnormal wear of the mill lining.

& mill liner brick is *Coors* because

are formed, they go directly to the high temperature kilns for firing...thus eliminating all stresses and voids.

Coors also uses all of the conventional wet processes as well as the ordinary dry-press process for the manufacture of many products which are not subjected to the pounding that mill linings and grinding media must take. But Coors uses only the Isostatic Process to make grinding media and liner brick, so they will withstand severe abrasion, impact shocks and other physical stresses.

Made of the same, identical high alumina ceramic which was developed as a grinding ball material...made by the same, identical Isostatic Process...Coors High Density Grinding Media and Mill Liner Brick are companion products. However, because of their uniformity and hardness, Coors Media will give you equally good grinding results, regardless of the lining material used

in your mill. Furthermore, the service life of any lining will be longer when the mill is charged with Coors media.

If you want maximum grinding results *plus* maximum service life from your pebble mills, your best buy is Coors High Density Grinding Media and Mill Liner Brick. And when the best costs little, if any more—why settle for less?

COORS PORCELAIN CO.
c/o LSP Industrial Ceramics Co.
275 Kalamath St., Denver 23, Colorado



Please send me technical information and samples of Coors Grinding Media.

Name.....
Title.....
Company.....
Address.....
City.....State.....

COORS PORCELAIN COMPANY GOLDEN, COLORADO

SOUTHERN'S 1 - SOURCE SERVICE



Precision-made by specialists!

Wide choice styles, sizes, finishes!



Famous for fast service!

Over 1 billion screws in stock!



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SOUTHERN SCREWS BRING YOU BUILT-IN DEPENDABILITY—DAY AFTER DAY!

If your job involves "juggling" to keep assembly costs down while production speeds up — better let us show you how Southern Screw can help solve your problems . . .

Southern are screw specialists . . . make fasteners exclusively . . . and we manufacture every screw we sell! . . . Famous for service and quality—Southern Screws earn your confidence, once you've tried them!

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Machine Screws & Nuts • A&B Tapping Screws • Wood Screws • Stove Bolts • Carriage Bolts
Wood & Type U Drive Screws • Hanger Bolts • Dowel Screws

HERE are the newest developments released to the editors of *finish* from components, supplies, and equipment manufacturers. Statements made in these items are reports from the supplier and, due to their newness, a field check by the editors is impossible. Suppliers, bringing out new items, are urged to notify the "What's New Editor"—but cautioned to minimize, insofar as possible, offering of information about items now common knowledge to the industry and our readers.

WHAT'S NEW

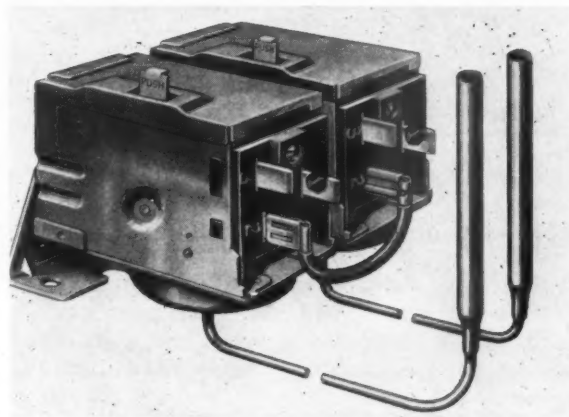
IN NEW COMPONENT DESIGNS IN NEW METAL FINISHES IN EQUIPMENT AND SUPPLIES

Another new service for readers of Finish

Two New Porcelain Enamels to be marketed—One for Aluminum Castings

A low temperature steel porcelain enamel and a non-toxic lead-free aluminum porcelain enamel will shortly be offered by Vitro Mfg. Co. The low-temperature for steel materials fire between 1250° and 1350°F on specially prepared enameling iron or cold rolled steel. With good resistance to weak acids and alkalies, application can be made in one or two coats with good properties. Black, dark colors, or pastel tints are obtainable with the clear type frit in one coat applications, or in two if so desired. White color coats may be applied as second coats over the clear type enamel, used as ground coat. The 1000° frits have been developed for firing on aluminum, with applications to wrought and cast shapes possible when metals are properly treated.

New Group of Pressure Operated Controls Announced

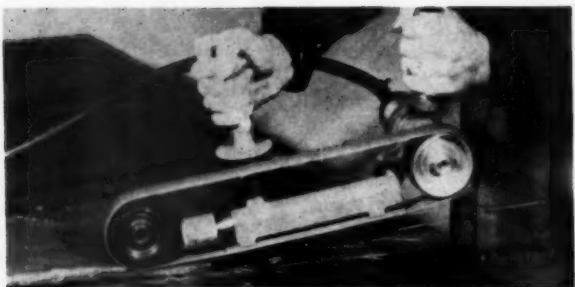


Ranco, Inc., has announced a new group of pressure operated controls. Small in size, they are available for commercial installation such as control panels. Highly versatile electrically, user has choice of switching assemblies to accommodate pilot duty use of 345 volt-amperes at 230 volts, up to heavy duty requirements of 15.5 amperes, full load, 84 amperes, locked rotor at 115 volts, a. c. only. Single pressure "G" controls include variety of combinations: i.e., automatic cycling, with manual reset-lock-out bar, with or without differential adjustment, for high or low pressure applications.

Ransberg Releases Triple Head—New Concept in Electrostatic Painting

Three atomizing heads, mounted in close relationship to each other on a common support member, is the completely new and major design change announced by Ransburg Electro-Coating Corp. Three independently operated integral motors, one for each atomizing bell, replace the shaft and gear mechanism driven by a single externally mounted motor on original triple head. Shipment of units will begin immediately. The integral motor design—already proven out successfully on the Ransburg disk rotators—will reduce maintenance and offer more versatility in mounting triple heads in horizontal, upright and inverted plane operations.

New Improved Portable Abrasive Belt Unit Developed



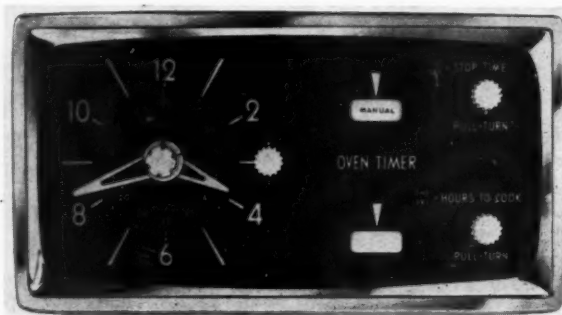
A light 6½ lb hand tool that fits nicely into a classification between hand filing and large portable wheel grinders has been announced by the Grinding and Polishing Machinery Corp. Tool design permits grinding on contact wheel, the platen or slack of belt for convex surfaces. Tool is air-motor powered. It will develop 4700 sfpm, is designed to take all hand filing out of plant operations.

New Germanium Diode Rectifier Features Less Than 5% Ripple

For plater faced with need to electroplate to specifications, Technic, Inc., has announced a new germanium diode rectifier which features less than 5% ripple. Heavy duty germanium diodes rated at 700 amps are used to give full operating efficiency over the entire load range and to insure long life. Equipment consists of 0 to 10 full powerstat control, with fused circuit with circuit breaker overload protection: dual ammeters, and volt meter. Designed for use with precious metals; it can be readily used for all electroplating.

New Automatic Timer for Electric and Gas Ranges

New, easily-set automatic timer has clock and oven timer completely separated to avoid confusion in demonstration and in actual use, according to International Register Co. The unit combines three instruments in one, comprising an electrically operated clock, an electrically operated interval timer, and a separate automatic oven timer which can be used either for semi or fully-automatic cooking. Optional feature includes a switch operated by interval timer for control of unit.



New Iron Phosphate Coating for Spray Application Announced

Pennsylvania Salt Mfg. Co. has announced a new iron phosphate coating for spray applications, Pennsalt Fosbond 25, designed for 3-stage washers. The material provides corrosion resistance and paint bond on more types of steel than previously was possible. The anhydrous concentrate contains no corrosive chlorides, minimizing wasteful deposits of sludge.

New Polyethylene Closures for Drum Manufacturers



A new use for molded polyethylene is well illustrated in the accompanying photo. Put onto the market earlier in the year, it's "newness to our readers" makes it an item for special attention. The plug is designed to fit standard bung wrenches and can be hand tightened. Vent closure also works in same simple fashion. Producer is Rieke Metal Products.



To Keep Your Product Quality High, Specify

YOUNGSTOWN SHEETS AND STRIP

This modern production line is busy turning out high quality steel stampings for electric range tops. To help maintain their excellent reputation for quality work, this progressive concern relies on Youngstown Sheets and Strip—the best drawing and stamping steel obtainable anywhere.

Youngstown's half-century of steelmaking know-how guarantees you a blend of the right combination of tensile strength, surface finish and ductility to provide top-production runs of even the most difficult-to-form work.

Satisfied users tell us they get increased production, fewer rejects, faster and more accurate forming, together with lower fabrication and die costs. Why not get the same advantages by making Youngstown Sheets and Strip your specification? They are quality-controlled through every steelworking, rolling and annealing operations to meet your most exacting requirements.

Contact our nearest District Office, today, for additional information or metallurgical assistance—or write directly to our Home Office



**COLD ROLLED
SHEETS
AND STRIP**

**THE
Youngstown
SHEET AND TUBE COMPANY**

General Offices - Youngstown 1, Ohio
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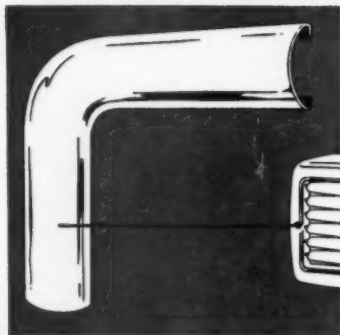
Producers of Quality Carbon and Alloy Steels for Over Half-a-Century

Custom Tailoring From a

Standard Shape

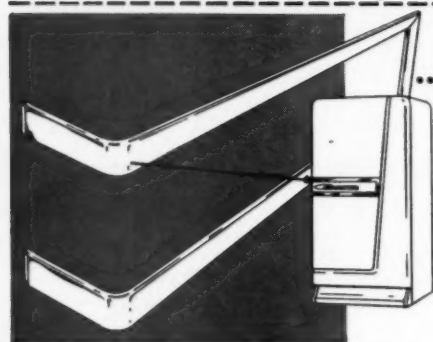
Pyramid Mouldings

Design Clinic



...AT NO TOOL COST

Standard sections can be custom tailored to combine *dollar savings* with *individual design*. For this heater, a standard Pyramid shape ... combined with a standard radius bender ... provided custom tailored trim ... at *no tool cost*.



...AT LITTLE TOOL COST

As shown by this door panel trim, a simple addition to standard tooling can often custom tailor a standard shape to a specific application. Here an inexpensive bending fixture transformed a standard section into individual panel trim.

WRITE FOR YOUR FREE "PLAN BOOK OF METAL MOULDINGS"

For low cost, custom application ... check your requirements against Pyramid's hundreds of standard shapes and, in many instances, standard bender fixtures and press dies. Send for Pyramid's "Plan Book" today.

Without obligation, please send copy of "Plan Book of Metal Mouldings."

Name _____ Title _____

Firm _____

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5365

Pyramid Mouldings Inc.

5365 WEST ARMSTRONG AVE., CHICAGO 30, ILL.
NEW YORK... CALIFORNIA

MEETINGS

*FIRST NOTICE IN THIS COLUMN

***NARDA ANNUAL CONVENTION**

National Appliance & Radio-Television Dealers Assn's annual convention, Merchandise Mart, Chicago, January 13-17, 1957.

***MIDWEST ENAMELERS**

Midwest Enamelers Club Meeting-Plant Visit, Argonne National Laboratory, Lemont, Ill., January 25, 1957.

JANUARY HOUSEWARES EXHIBIT

The National Housewares and Home Appliance Manufacturers Exhibit, Navy Pier, Drill Hall, Chicago, Illinois, January 17-24.

AIEE GENERAL MEETING

American Institute of Electrical Engineers General Meeting, Hotel Statler, New York, N. Y., January 21-25.

IHEA MEETING

Industrial Heating Equipment Association, Inc., Meeting, Washington, D. C., January 28-29.

NATIONAL ENGINEERING SHOW

The Eighth National Plant Maintenance & Engineering Show, Cleveland Public Auditorium, Cleveland, Ohio, January 28-31, 1957.

NESA CONVENTION

Eleventh Annual National Electric Sign Assn. Convention and Sign Equipment Exhibit, Sheraton Park Hotel, Washington, D. C., February 17-20, 1957.

IHAC EXPOSITION

International Heating and Air Conditioning Exposition, International Amphitheatre, Chicago, Ill., February 25-March 1.

ASHACE ANNUAL MEETING

American Society of Heating and Air Conditioning Engineers, Inc., Annual Meeting and Exposition, Chicago, Ill., February 25-March 1.

***PMI NATIONAL MEETING**

Annual spring technical meeting of Pressed Metal Institute, Hotel Carter, Cleveland, Ohio, March 6-8, 1957.

to Page 14 →

JANUARY • 1957 finish

She can
cook, too...

and better with
utensils made of

**FAIRMONT
ALUMINUM**

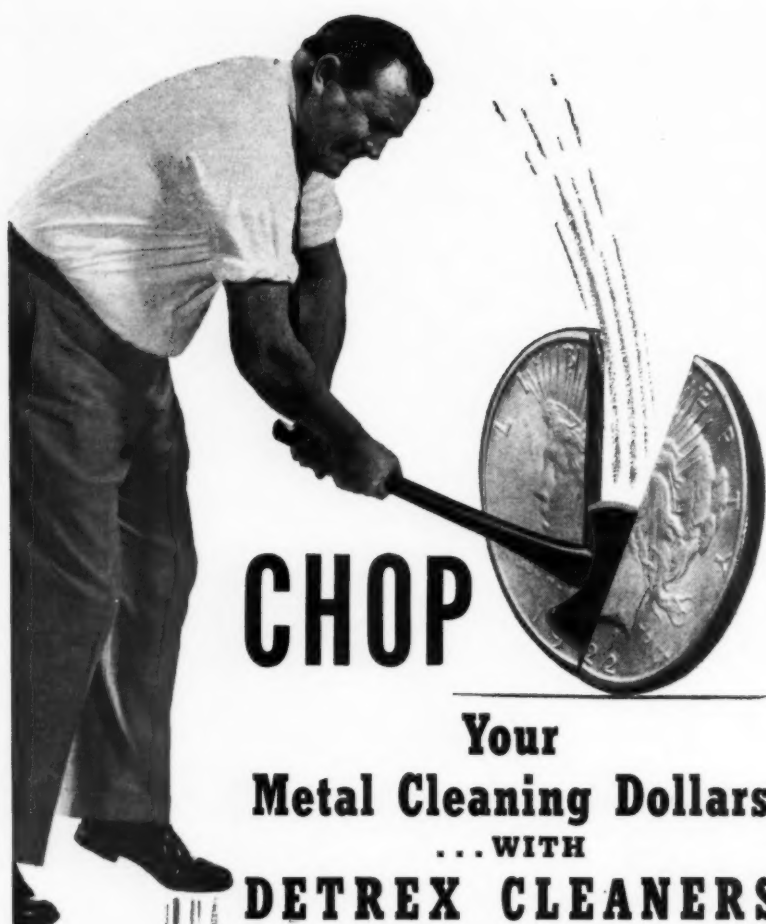
Utensil manufacturers specify Fairmont 1100 and 3003 wrought aluminum sheet for nationally recognized highest quality and uniformity. The advantages which Fairmont Aluminum offers to the manufacturer are many—improved appearance, higher thermal conductivity, lighter weight, wear-resistant ductility for those seeking a non-corrosive and stain-proof surface.

Fairmont wrought aluminum sheets, coils and circles are available for prompt delivery to meet rigid manufacturing schedules.

Sales offices in principal cities

FAIRMONT
ALUMINUM COMPANY

SUBSIDIARY OF CERRO DE PASCO CORPORATION
FAIRMONT, WEST VIRGINIA



CHOP

Your Metal Cleaning Dollars ... WITH DETREX CLEANERS

Detrex alkaline and emulsion cleaners possess extraordinary properties for the removal of soil from metal and the prevention of rust. Increased efficiency and worthwhile savings can be obtained by calling on skilled Detrex service personnel to keep your metal cleaning operations at peak efficiency.

Whether you are considering a completely new cleaning operation or are interested in improved efficiency of your present operation... you can rely on Detrex to cut your metal cleaning costs. Mail the coupon for complete information.

☐ Send me complete information on Detrex alkaline and emulsion cleaners.

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COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



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CHEMICAL INDUSTRIES, INC.

Dept. A-1007

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DEGREASERS • DEGREASING SOLVENTS • WASHERS • ALKALI
AND EMULSION CLEANERS • PHOSPHATE COATING PROCESSES

MEETINGS CONTINUED

*EASTERN ENAMELERS MEET

Eastern Enamelers Club Meeting, Statler hotel, New York City, February 9. Prominent speakers will be featured.

*TENTH METAL EXPOSITION

Tenth Western Metal Exposition and Congress, American Society for Metals and Technical Groups, Pan-Pacific Auditorium and Ambassador hotel, Los Angeles, Calif., March 25-29, 1957.

GAMA ANNUAL MEETING

The Gas Appliance Mfrs. Assn., annual meeting, The Greenbrier, White Sulphur Springs, West Virginia, April 8-10.

AMERICAN WELDERS SHOW

The American Welding Society, national spring technical meet and welding show, Hotels Sheraton and Bellevue-Stratford, Philadelphia, Penn., April 8-12, 1957.

*FIRST WACHVR CONFERENCE

First Western Air Conditioning, Heating, Ventilating & Refrigeration Conference and Exhibit, Shrine Exposition Hall, Los Angeles, Calif., May 3-7, 1957.

NATIONAL HOUSEWARES EXHIBIT SLATED AS INDUSTRY'S LARGEST

The forthcoming National Housewares Exhibit, scheduled to be held at Navy Pier and Drill Hall, Chicago, January 17-24, 1957, will have a total of 726 exhibitors, a record number, and there will be more housewares shown, both electrical and otherwise, than at any previous trade show, according to an announcement. The show, sponsored by the National Housewares Manufacturers' Assn., will present more new products than ever before, and several improved services have been initiated.

Registration facilities will be available at both Navy Pier and Drill Hall, and NHMA will also provide free special bus service to buyers between the Loop, near-Northside hotels, and the show site. Another convenience for buyers will be longer show hours each day. Hours will be from 9:00 am to 6:00 pm, except the last day when the show will close at 2:00 pm. The exhibit will not be open Sunday, January 20. Major social event of the show will be the NHMA dinner party, Tuesday, January 22, in the Grand Ballroom of the Palmer House.



from the Editor's Mail

General Metalcraft feature

Gentlemen: Our sales department would like three more copies of the June, 1956 issue of *finish* which contains the feature article on General Metalcraft's plant at Olympia, Wash. We think your story was well done, and particularly interesting to those of us who have visited the plant since it was first established. . .

Edward A. Gross
Pacific Paint and Varnish Co.

Hails finish support

Gentlemen: I am interested in receiving your magazine regularly. It should be most helpful in my work, range engineering. . .

J. E. Harris
Manager, Range Engineering Div.
Philco Corp.
Philadelphia, Penn.

Finish articles helpful

Gentlemen: I wish you would add my name to the mailing list of your fine magazine. The excellent representation of the topic, and the wealth of your information, has helped me many times when I had to explain new and conventional production methods to Admiral's foreign associates.

Ernest W. Patsch, Design Engineer
Midwest Manufacturing Corp.
Division of Admiral Corp.
Galesburg, Ill.

Likes our service

Gentlemen: I would like to thank you for the speed with which you filled the request for tear sheets of the first part of "Formability of Metals." Both the tear sheets, and the efficiency with which the request was handled, are greatly appreciated. I am very interested in obtaining tear sheets of the second part of this article, which appears in the November issue of *Finish*. Would you please forward tear sheets of this, and subsequent, portions of the article?

E. A. Kopcho
Process Development Section
Materials Laboratory
Westinghouse Electric Corp.
Aviation Gas Turbine Division
Kansas City, Mo.

Needs advice on screws

Gentlemen: We have a request from one of our customers to supply steel screws which are to be colored, either all over or just on the head, to match an ivory color, MUP-32. These screws are a #6 Type "A" sheet metal screw with a

slotted head. We have been requested, as I said, to match the color for the customer. We are at a loss to know what type of color can be installed on a screw that will not chip off when you drive it in by means of a screw driver inserted in the slot of the screw. We request information from you as to where this type of finish may be obtained, or where information as to its installation may be obtained. We are interested in finding out how we can do this to the screws that we manufacture.

James E. Arkison
Keystone Screw Corp.
2314 N. 9th St.
Philadelphia 33, Pa.

Ed Note: If any of our readers have suggestions for possible solutions to this problem, we will appreciate receiving them.

Interested in reprints

Gentlemen: In the October, 1956 issue of *finish* there appeared an article on "Low Temperature Porcelain Enameling." One of our members has evinced considerable interest in this article, and we wonder whether you will be kind enough to send us a tear sheet that we can forward to him.

David M. Borcina
Lead Industries Association
60 E. 42nd St., New York 17, N.Y.

Ed Note: In addition to Frank H. Thomas' article, to which you refer, your member may be interested also in the article entitled "Top Interest in Low Temperature Enameling Draws Capacity Crowd to 18th Shop Practice Forum," by Charles R. Sample, Managing Editor for *finish*, dealing with cleaning operations in aluminum preparation, and electrostatic application of colors. Meanwhile, the tear sheets you requested are on the way.

Another Spencer article request

Gentlemen: Please forward tear sheets on series of articles (4) currently appearing in *Finish* magazine on the subject "Formability of Metals," by Lester F. Spencer.

J. B. Marquette
Vice president, Purchases
Parish Pressed Steel
Division of Dana Corp.
Reading, Pa.

More on "Formability"

Gentlemen: Please send to the undersigned a tear copy from the November, 1956 edition of *finish* entitled "Formability of Metals," by Lester F. Spencer, page 44, part two, "The Carbon Steels."

Joseph J. Cada, Chief Engineer
Autopoint Company
Division of Cory Corp.
Chicago, Ill.

Appreciated laundry salute

Gentlemen: I read, at home, your 10th annual section for the Home Laundry Appliance Industry . . . this was well done, and made very good reading matter . . . thank you. . . .

B. J. Hank
Conlon-Moore Corp.
Chicago, Ill.

More about formability

Gentlemen: We would appreciate receiving the price and availability of the following: "Formability of Metals," series of four parts, reprinted from *finish* magazine. If there is no charge for the above, please send to this company, 2000 North Memorial Drive, attention of the Engineering Library, D-250.

D. E. Dunlap, Chief Engineer
Tulsa Division
Douglas Aircraft Company, Inc.
Tulsa, Okla.

Another Statistical Review request

Gentlemen: In a recent meeting one of our divisional executives referred to some of the statistics that were published in your Third Annual Statistical Review . . . Can you send me a copy of the reprint of the statistical review that appeared in your April issue?

John A. Drake
Mgr. of Market Research
Borg-Warner Corporation
Chicago, Illinois

Ed. Note: Two copies of the Third Annual Statistical Review are on the way.

Appreciates Olson presentation

Gentlemen: Thank you . . . our public relations director said that the article "New textiles and the 'miracle fabrics'" (Ann Olson, *finish*, Sept., Page HL-32) received the best treatment and layout . . . so we were naturally pleased . . . your idea of presenting a home laundry section is very good, and also very current, since there seems to be a need for such laundry information. . . .

Ann L. Olson, Director
Home Economics Dept.
Crosley & Bendix
Cincinnati, Ohio

Likes safe transit section

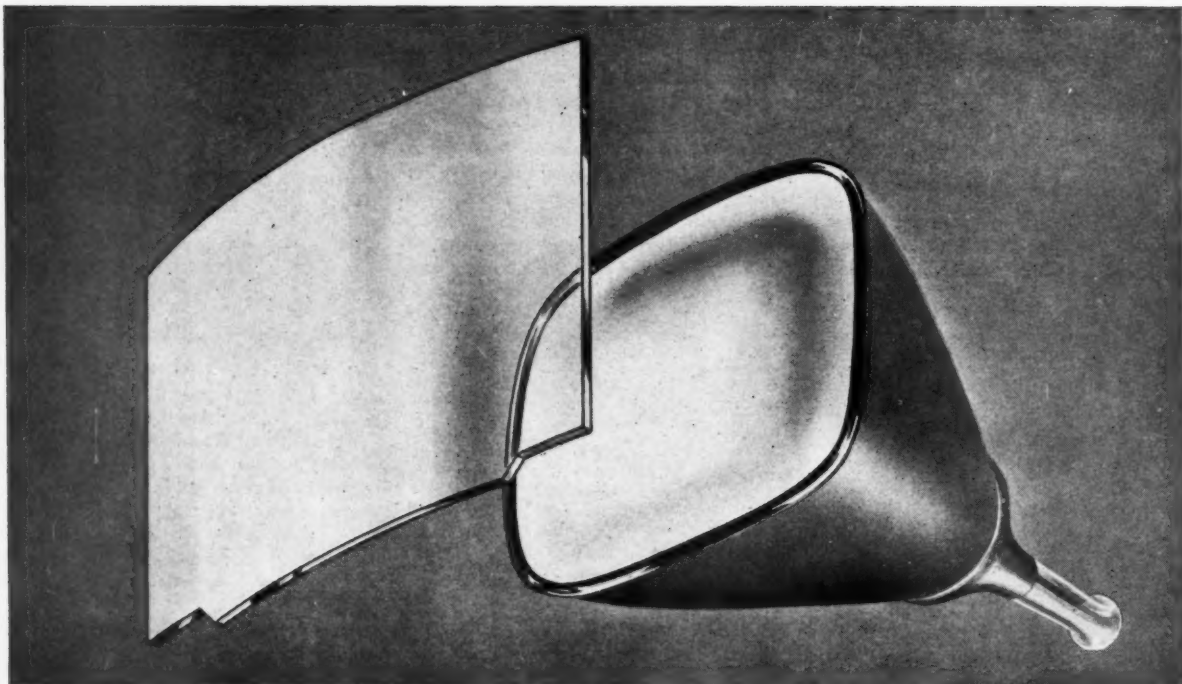
Sir: Having read your magazine for several months, I wonder if I could be added to your controlled circulation list. As supervisor of stores and warehousing, I am particularly interested in the *Safe Transit Section* which is a part of the magazine every month. . . .

Melvin J. Evans, Supervisor
York Corp.
Grantley Plant
York, Penn.

ERRATA

A *finish* reader calls our attention to an error in spelling and initials in a news item in the November issue of *finish*.

Under the heading "Merger of Patterson-Ferro Firms Announced," the initials for Mr. Marks, Ferro executive vice president, were given as I. T. They should have been H.T. The correct spelling for the name of the new president of Patterson is C. W. Gerster.



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**put that "I enjoy it" look
in housewives' eyes**



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Ask the Pemco sales engineer who calls on your company for complete information on Pemco Covercoats and the many advantages they offer.

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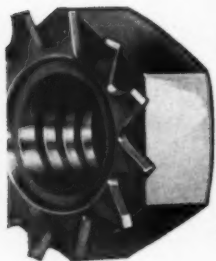
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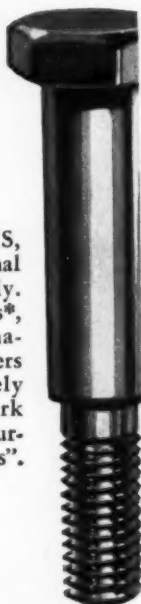


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Compact, complete recirculating Water-Type Dust Collectors for industrial processing dusts. Dirt is collected as wet sludge which may be carried away automatically. No moving parts. Extremely efficient for grinding operations. Eliminates danger of explosion from magnesium and aluminum dust. Proven in foundries. Standard Units available.

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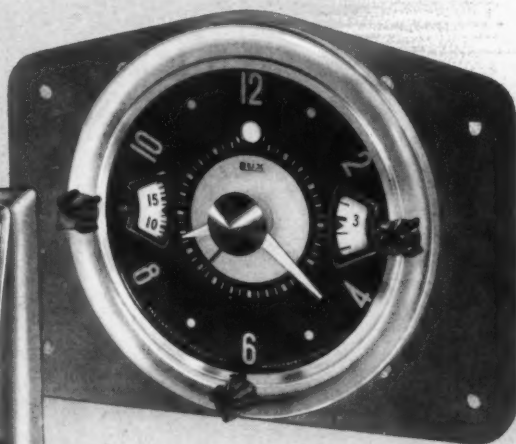
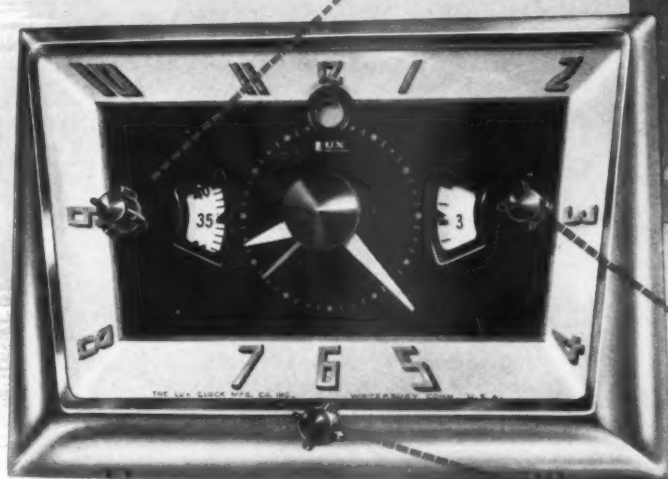


SHE doesn't need to "PUZZLE OUT" a

LUX

FULLY AUTOMATIC RANGE TIMER

MINUTE MINDER
Bell Chime Reminder
for Top Burner Cooking



SIMPLIFIED 2-STEP AUTOMATIC SETTING

Big sales impact the new LUX Range Timer will add to your ranges is *simplicity*. There's no need for a housewife to "puzzle out" diagrams, struggle with instruction manuals, call in service men. She just sets bottom "time-to-start" knob and righthand "hours-to-cook" knob. Oven starts and stops automatically.

Write, wire or phone for full specifications and a LUX Timer to test in your own lab.



1 Time-to-start

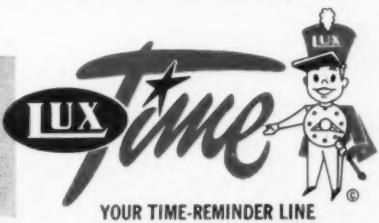


2 Hours-to-cook

PLUS

- Exclusive one knob "cook-now" timing.
- Separate Minute Minder Top-Side Control
- New Synchronous Motor Requiring No Lubrication.
- Snap-in Mount that Eliminates Studs and Rings.
- Smart 3-Dimensional Styling

DEPARTMENT F
THE LUX CLOCK MFG. CO., INC.
WATERBURY 20, CONNECTICUT



YOUR TIME-REMINDER LINE

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TRADE MARK
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PRODUCTS

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Preway Inc.

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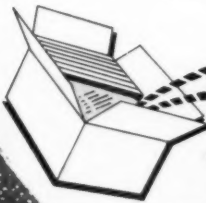
**GENERAL
STEEL WARES**
G.S.W.

Hotpoint Co.

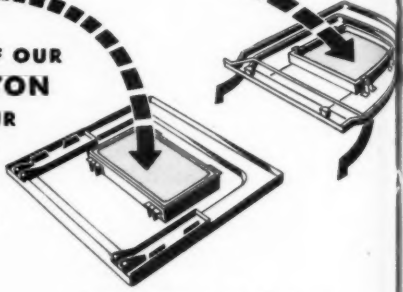
**EAGLE RANGE & MANUFACTURING
Company**



PERMA



OUT OF OUR
CARTON
INTO YOUR
DOOR



Alternate methods of attachment
may be used.

These well known names and
trademarks represent some of the
leading manufacturers of gas and
electric ranges currently using
PERMA-VIEW windows.

PERMA-VIEW

THE BEST SALESMAN FOR YOUR BUILT-IN OVEN...

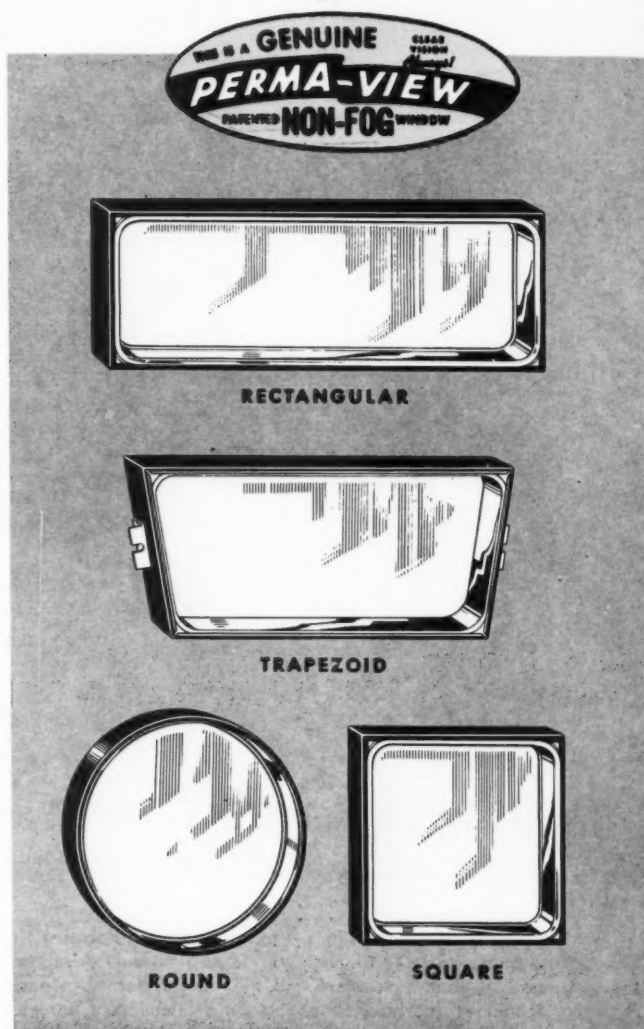
With the growing trend to built-in appliances more and more leading manufacturers of built-in oven units have turned to PERMA-VIEW "the window you can see through always."

The strong steel encased, double pane PERMA-VIEW window incorporates the finest quality heat resisting glass. It is mechanically sealed to prevent infiltration of vapors and to eliminate "fogging." This "No-Fog" window meets the constantly growing demand for "visible baking."

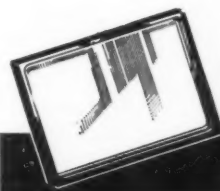
As a practical, economical and effective sales feature PERMA-VIEW can be your best salesman. Be sure you take advantage of this sales feature in your new built-in models.

The PERMA-VIEW window is pre-engineered, and comes to you ready for immediate installation in your range. "Out of our carton into your door." Let our specialized production lines serve as a part of your subassembly facilities. Phone or write us for complete details on the ease and economy of adding this important sales feature.

A phone call or letter will bring an experienced engineer to your plant for prompt consultation. PHONE: Market 4-1591 WALLED LAKE, MICHIGAN



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TROUBLE SHOOTING

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NEW END USES

QUALITY TESTING



General view of the main research laboratory area of the Chicago Vitreous plant.

QUALITY DEVELOPMENT

IMPROVED PROCESSING TECHNIQUES

CHICAGO VIT RESEARCH BENEFITS THE ENTIRE INDUSTRY

Expanding the market for porcelain enamel has always been a long range objective of Chicago Vit. Result—product developments and coatings that have increased the use of porcelain enamel; new techniques that have simplified the production of porcelain enameled parts; improved methods that have contributed to a greater operating efficiency and reduced costs in porcelain enameling plants everywhere.

These are but a few of the many ways the Chicago Vit program of

continuous research benefits those companies engaged in porcelain enameling operations.

We hope that you will consider our research and development facilities an adjunct to your shop . . . an easy, sure way of solving enamel problems that may arise from time to time. Contact your Chicago Vit sales or service representative. He will give you on-the-spot advice and help, and will tell you the many ways the Chicago Vit laboratories can be of assistance to you.

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THE **finish** **LINE**

A BRIGHT OUTLOOK FOR 1957 — There was much "wailing" during the mid-1956 in the appliance and fabricated metal products industry over the prospects for production and sales totals at the end of the business year. Now that 1956 is behind us, let's review the facts concerning industry business during the past year and take a brief look at the future.

Unquestionably, there were some "soft spots" in the home appliance field in connection with specific appliances and individual company records. However, after scanning dozens of year-end reports and forecasts from leading associations and from individual company statisticians, it can be safely reported that 1956 was a *good* year in the appliance and fabricated metal products field, generally speaking, and that many of the soft spots were offset by "bright spots" in which individual product categories ran well ahead of 1955 and in some cases hit an all-time high.

The blue flame

The blue flame of the gas appliance industry burns brightly, according to Julius Klein, president of Caloric Appliance Corp., who reports in this issue as president of the Gas Appliance Manufacturers Association. A continuation of the multi-billion dollar expansion of the natural gas pipeline system adds fuel to this flame.

Such products as automatic gas water heaters, boilers, direct heating units and gas clothes dryers established new shipment records to help hold the gas appliance industry on an even keel and to offset the effect of the drop in new home starts for 1956. Read the gas industry forecast in which it is indicated that the industry will top its 1956 performance in 1957.

Electric appliance highlights

In his annual report to *finish* readers on the outlook for electrical appliances, A. J. Nesti, chief statistician for NEMA, reports that built-in electric ranges, electric dishwashers, food waste disposers, and dehumidifiers all showed heavy increases in sales in 1956 and, he says, "... are expected to continue strong in 1957."

A drop off in standard range sales of 200,000 units from 1955 was practically offset by an increase of 185,000 built-in units. This spokesman for NEMA expects that refrigerators, freezers, and storage water heaters will furnish real strength for the business picture next year among major electric appliances.

1956 best air-conditioning year

A report in this issue for the Air-Conditioning and Refrigeration Institute by Geo. S. Jones, Jr., shows both room and central air-conditioning installations up in 1956 with room air conditioners alone totaling more than 1,600,000 units for the year. In short, the air-conditioning section of the industry had its biggest year to date in '56.

Both commercial air-conditioning and commercial refrigeration are expected to play an important part in the "golden age" of air-conditioning and refrigeration, forecast for 1957 and the next decade by Mr. Jones.

Radio - electronics - television

A year-end statement by Dr. W. R. G. Baker, president, Radio-Electronics-Television Manufacturers Association, shows that the R-E-T industry increased in size by 15 per cent in 1956. He predicts that this year will bring an added ten per cent gross in support of the claim that his association represents one of the country's foremost growth industries.

Final figures will show that the 5.9 billion dollar mark was reached in '56 in terms of production and sales. The RETMA marketing data department reported that while television receiver production "leveled off" last year, 7 million sets were sold, making 1956 one of the best full years in television production history.

In contrast to television receiver sales, radio sales for '56 increased about 20 per cent over the 1955 figure.

Clean homes for the future

A report by Oscar M. Mansager, executive vice president, The Hoover Co., as president of the Vacuum Cleaner Manufacturers' Association states that, for almost two and a half years, the industry's factory shipments have broken a record of one kind or another in each month of that whole period. Said Mr. Mansager, "We believe this is unparalleled in all home appliance manufacturing and marketing." He forecast "continued heavy consumer purchasing of household vacuum cleaners throughout the coming year. . . ."

More soft water

In a report from the plumbing and heating industry's bureau, R. M. Thomas, president of the Water Conditioning Foundation, and national sales manager, Water Conditioner Division, Rheem Mfg. Co., stated that fully automatic and semi-automatic softeners will be promoted more vigorously, to capitalize on the growing consumer preference for this type of equipment.

The bureau report states that water softener manufacturers expect a minimum ten per cent boost in production in 1957 above the current output rate of half a million units.

A smile for '57

These brief references to reports of leading industry spokesmen, combined with a review of many other similar reports from allied industries and from leading individual production units within the appliance and fabricated metal products field are all in the same vein: 1956 will undoubtedly go down in history as a generally good year by any reasonable standard of measurement, and the forecasts for 1957 are overwhelmingly on the plus side of the ledger.

Having found that forecast reports from the same sources over a period of years have been proven historically conservative, there seems little to be suggested to our manufacturer readers except "a smile for '57."

Dana Chase

EDITOR AND PUBLISHER

The outlook in the gas appliance field

by *Julius Klein*, PRESIDENT, GAS APPLIANCE MANUFACTURERS ASSOCIATION, AND PRESIDENT, CALORIC APPLIANCE CORPORATION

NEW markets, and a boom in home modernization, enabled the gas appliance and equipment industry to offset the effect of a drop in new-home starts during 1956, and there are strong indications that the industry will top its 1956 performance in 1957.

Manufacturers in some categories equalled, or surpassed, all-time records established in 1955. For example, manufacturers of automatic gas water heaters shipped 2,837,000 units, 3.2 per cent above the 1955 peak, and they are confident that gas water heaters will approach or top the three-million mark in 1957. It's worth noting that record unit volume is accompanied by a marked upgrading in size and quality. Larger families, extra bathrooms, automatic washing machines and dishwashers require more hot water, and these requirements provide a continuing stimulus to the demand for bigger and better automatic gas water heaters.

Central heating shipments steady

Shipments of gas central heating equipment were about even with the 1955 peak, and the 1,125,000 unit total for 1956 established gas as the number one heating fuel in the nation's homes.

Warm air furnaces approximated 829,000 units, down slightly from the record 835,000 shipped in 1955. Boilers established a new all-time high of 98,000 units, nearly nine per cent above 1955, while conversion burners slipped from 209,100 units to 198,000.

Continuation of the multi-billion-dollar expansion of the natural gas pipeline system during the past year enabled gas utility companies and manufacturers in many areas to cut into the backlog of thousands of applications for gas house heating that were held up pending completion of expanded transmission and distribution facilities.

The direct heating picture

Gas direct heating equipment benefited substantially from the home-modernization trend, particularly from projects involving the addition of rooms

or enclosed porches. Shipments of the direct heating units — designed to heat the room or space in which they are installed — totaled 1,700,000 units, more than 15 per cent above 1955.

The increase in direct heating shipments more than offset losses in vented recessed wall heaters and floor furnaces which were adversely affected by a decline in housing starts in areas where these units are most popular. Wall heater shipments were off 15 per cent to 301,000 units, and floor furnaces down 13 per cent to 134,000.

Gas clothes dryers continued to move ahead strongly to establish an all-time high, with shipments topping the 450,000 mark for the first time in history. The clothes dryer demand continues to mount, and shipments in 1957 will undoubtedly set another record somewhere beyond the half-million mark.

Makers of gas incinerators enjoyed a satisfactory year, and have high hopes for 1957. New and improved models, a growing understanding on the part of municipal officials of the virtues of the gas incinerator, increased interest in incinerator sales by merchandising utility companies, and the acute disposal problems in many communities, all point to a rapid increase in demand.

Shipments of conventional or free-standing gas ranges were about ten per cent below the 1955 total, but shipments exceeded two million units for the tenth consecutive year, and a substantial part of the difference was made up in shipments of built-ins which enjoyed an upsurge in sales. I believe the built-ins will provide more than ten per cent of the gas range market in 1957, with built-in shipments passing the quarter million mark.

The built-ins, which hitherto have been utilized mostly in new homes, are now in greater demand for existing homes undergoing kitchen modernization. This demand will be stimulated further in 1957 by such national campaigns as Operation Home Improvement and A.C.T.I.O.N. — American

Council To Improve Our Neighborhoods.

These campaigns are particularly important because they encourage improvement projects which will take up the slack should new home starts follow the predictions of a further decline in 1957. There are other important factors which provide the basis for optimism throughout the gas and gas appliance industries.

Natural gas entry big factor

The arrival of natural gas in the Pacific Northwest in the latter part of 1956, (see November *Finish*, P. 69), sparked a demand for all types of gas appliances and equipment—residential, commercial, and industrial. Manufacturers, particularly those on the west coast, noted a quick surge in orders from Portland and Seattle when the pipeline reached those cities. The demand for gas service and appliances in the Northwest will continue to grow as additional communities are connected to the pipeline, and as homes and industries convert to gas from other fuels.

Continued expansion of transmission and distribution facilities, in which the gas industry will invest \$7 billion in the 1956-1959 period, will bring new or additional supplies of natural gas into hundreds of communities from coast to coast, to insure greater fuel supplies and a constantly growing market for gas appliances and equipment of all kinds.

The availability of adequate supplies of the natural fuel, and the re-examination of main extension policies by many utility companies, will be of great importance in major new home developments, many of which were deprived of gas service in the past because of the lack of transmission and distribution facilities.

I am sure we'll see a great wave of all-gas homes as the result of unprecedented cooperation between gas companies and builders. In other words, whether new home starts increase or

decrease, the gas appliance industry will equip an increasing percentage of the new dwellings.

Industry optimistic of future

Perhaps the most important reason for optimism can be found in the gas industry's own plans for exploitation of all of its opportunities for service and sales.

Critics within the industry have complained for years that it has been under-promoted. That may have been true in the past. It will not be true in 1957.

All of the industry's important past promotional programs will be carried on again — the PAR program, Old Stove Round-Up, Mrs. America, New Freedom Kitchen & Laundry operations — and on a larger scale. In addition, new activities will provide sales impact unprecedented in our business.

Starting in January, the gas industry will have a top-flight network television program for the first time. Utility companies subscribed the bulk of more than \$2,250,000 to underwrite this venture into this powerful medium, but the support of pipeline companies and manufacturers is indicative of a new spirit of cooperation among all seg-

ments of the industry that is certain to be reflected in sales.

Another example of effective cooperation is the formation of the Gas Unity Committee, and the development of its program, which involves utility companies, LP-Gas dealers, and manufacturers, as well as AGA, GAMA and LPGA in campaigns to sell the advantages of gas to the American homeowner — city gas or LP-Gas, wherever he lives.

The Unity program is already operating, in one form or another, in eight states and is spreading rapidly. Newspaper and highway sign advertising — jointly sponsored by gas utility companies and LP dealers, are being used regularly and effectively. In addition, sales departments are exchanging market information and leads to promote maximum productivity in sales solicitations and follow-ups.

Advertising campaign to continue

There are many other examples of the industry's determination to do an adequate promotion job. The Gas Equipment Manufacturers Committee, a group of gas industry suppliers who have nothing to sell to the general public, are about to enter the third year of the GEM program of national

consumer advertising of the seven household uses of gas. The equipment manufacturers plan to increase their expenditures this year to more than \$300,000.

The GAMA domestic gas range division is working out the details of a promotion program for the next two years, which is by far the most ambitious and comprehensive cooperative effort ever contemplated by any appliance or equipment division in the industry.

These and other promotion programs, coupled with the public relations efforts of GAMA, AGA and LPGA, mean that our gas and gas equipment will be kept constantly in the minds of all of our publics. The virtues of gas as a fuel, and of modern automatic gas appliances as aids to better living, will be better known during 1957 than ever before.

We have the finest array of appliances and equipment ever offered to consumers. We have better fuel distribution than ever before. With a zooming population we have the greatest market in history. And we have the best supported program to take advantage of our tremendous potential.

Will 1957 be a good year? I don't see how it can miss.

The outlook for electrical appliances

by *A. J. Nesti*, CHIEF STATISTICIAN, NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

THIS is the story of the past year, and for next year, for Major Electric Appliances falling within the Major Appliance Division of the National Electrical Manufacturers Association.

Built-In Electric Ranges, Electric Dishwashers, Electric Food Waste Disposers, and Electric Dehumidifiers all experienced heavy increases in sales in 1956 and are expected to continue strong in 1957.

While shipments of stable items such as Standard Electric Ranges, Electric Refrigerators and Freezers, and Electric Storage Water Heaters dropped off 3 to 15 per cent in 1956; sales of Dehumidifiers almost doubled; sales of Electric Built-In Ranges almost doubled; Dishwasher sales were up 35 per cent, and Food Waste Disposer sales increased almost 15 per cent.

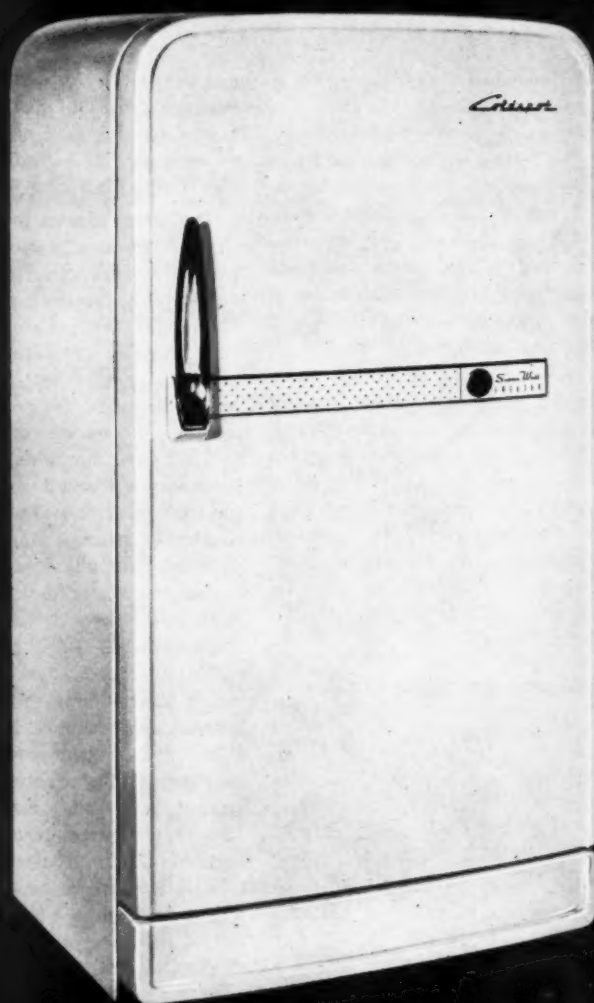
Trend toward built-in ranges

Of particular significance is the shift to Built-In Electric Ranges. Standard Range sales dropped 200,000 units, from 1,400,000 in 1955, to 1,200,000

units in 1956. At the same time, however, Built-Ins went from 200,000 units to 385,000 units, thus keeping total Electric Range sales practically up to the 1955 level of 1,600,000 units sold.

NEMA MAJOR ELECTRIC APPLIANCES Total Industry Sales — Number of Units (Including Exports)

	Year 1955	Year 1956	% Change 56/55	Year 1957	% Change 57/56
Electric Dehumidifiers . . .	95,000	275,000	+189.5	300,000	+09.1
Electric Dishwashers . . .	295,000	400,000	+35.6	475,000	+18.7
Electric Food Waste Disposers	520,000	590,000	+13.5	650,000	+10.2
Electric Farm and Home Freezers	1,100,000	975,000	-11.4	1,000,000	+02.6
Electric Ranges					
Standard	1,400,000	1,200,000	-14.3	1,200,000	0
Built Ins	200,000	385,000	+92.5	425,000	+10.4
Total	1,600,000	1,585,000	-0.9	1,625,000	+02.5
Electric Refrigerators . . .	4,200,000	3,700,000	-11.9	3,900,000	+05.4
Electric Storage Water Heaters	900,000	870,000	-03.3	900,000	+03.4



Whirlpool-Seeger
*freezers that guard
the peak of flavor*

On modern
freezers

DULUX® meets the exacting requirements
of today's topflight manufacturers



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Better Things for Better Living . . . through Chemistry

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home-appliance finish**

Over 53,000,000 major home-appliance units now in
service are finished with Du Pont DULUX Enamel.

LEADING APPLIANCE MANUFACTURERS know that durable Du Pont DULUX is a finish of *consistent* quality. Every shipment of this fine finish meets the *same* rigid specifications. And that's just one of the important cost-cutting, sales-winning advantages that DULUX offers.

Constant research by Du Pont chemists has resulted in a finish that gives more rugged resistance to chipping, cracking, scratching and staining. Application costs are lower, too—without sacrifice of quality appearance and dependable performance.

DULUX keeps its flawless appearance after years of constant use in the home. Its easy cleanability, resistance to wear and long-lasting whiteness help build the continued customer satisfaction so vital to the success of any appliance line. *No wonder so many of today's topflight appliance manufacturers use Du Pont DULUX Finishes.*

E. I. du Pont de Nemours & Co. (Inc.), Finishes Div., Wilmington 98, Del.

ELECTRIC CONTINUED

This trend to Electric Built-In Ranges is expected to continue in 1957 when they are estimated to show sales of 425,000 units out of an Electric Range total of 1,625,000 units.

Electric Dishwashers are fast approaching the half-million mark, with shipments going from 295,000 units in 1955 to 400,000 units in 1956, and to an expected total of 475,000 units in 1957. Keeping ahead of Dishwashers

are the increasingly popular Food Waste Disposers, which went over the half-million unit mark in sales in 1955, and then scored a 13½ per cent increase in shipments in 1956. In 1957, sales of this item are expected to go up another 10 per cent to bring total shipments to 650,000 units. Electric Dehumidifiers, after a very unusual spurt in 1956 when shipments jumped to 275,000 units from 95,000 units in 1955, are expected to slow down somewhat in 1957 with sales estimated at

300,000 units, an increase over the past year's sales of almost 10 per cent.

While not as spectacular as the newer Electrical Appliances, Refrigerators, Freezers and Storage Water Heaters are nevertheless still expected to furnish the real strength in the business picture next year for the Major Electric Appliance Industry. All three of these items will recover some of the loss experienced last year and will account for a composite sales total of almost six million units.

1956 Best Air-Conditioning Year

by Geo. S. Jones, Jr. • MANAGING DIRECTOR AIR-CONDITIONING AND REFRIGERATION INSTITUTE

THE air-conditioning and refrigeration industry looks forward to 1957—and the next decade—as its “golden age.”

Latest arrival in America's family of big consumer industries, the *air-conditioning* phase which has grown up as the precocious offspring of mechanical refrigeration, *had its best year to date* in 1956, but feels that records set in the year just ended will be regarded from the heights of 1957 and the years immediately following, much as the earlier era, when the “iceless icebox” was feeling its way into America's kitchens, is regarded today.

And while air-conditioning of America's homes, offices, farms and factories promises to send this new industrial giant to new and greater heights, mechanical refrigeration, the Twentieth Century marvel from which it was born, continues to entrench itself as an indispensable part of our civilization. New processes of food preparation and merchandising alone point the way to an even greater role for its products in 1957 and the coming years.

Conditioner installations up in 1956

More than 1,600,000 room air-conditioners were sold during 1956, more than 300,000 above the 1,270,000 sold in 1955, and representing a gain of about 5,000 per cent over the 30,000 output in 1946, first post-war year.

No accurate figures are available as to central air-conditioning installations in homes during 1956, but estimates range up to 170,000 or more, a con-

siderable increase over 1955 when an estimated 130,000 were installed. Residential installations in 1957 may be expected to be in the neighborhood of 200,000 or more. . .

If relaxation of credit regulations of the government agencies as they apply to installation of air-conditioning in mortgage-guaranteed homes and to the addition of air-conditioning equipment to existing homes becomes effective, it is reasonable to expect that a greater number of central installations will be made than is now anticipated, thus swelling the market even further.

In the residential field, increasing installations are expected to follow a curve whose “steepness” will increase in mathematical progression, particularly since the du Pont survey conducted late in 1956 shows that the ripest market for central air-conditioning lies in the next-door and immediately adjacent neighbors of those homes which have such comfort. Thus as more are installed, more “next door neighbors” will be affected and will seek the same sort of environment their neighbors' home provide.

Another factor which points to an increasing number of home installations is the promotional activity which will result from a second year of “Operation Home Improvement,” and the elaborate nation-wide plans for observance of “National Electrical Week” in February.

Look at “the big picture”

But residential air-conditioning is only one segment of “the big picture.”

More of the nation's large hotels are planning air-conditioning installations in 1957, following on the heels of literally hundreds which made such installations in the year just concluded. A survey late in 1956 revealed that New York hotels alone had about 13,000 air-conditioned rooms to offer visitors, and other cities are following the lead.

All of the new office buildings of any size are being constructed either with air-conditioning already installed or with provision made for its installation at a later date. . .

Leading the trend toward air-conditioning of office space is our own federal government. It is doubtful if the government will ever build another office building anywhere in the country without air-conditioning. . .

As an indication of the market in the hospital field, it is estimated that at the present time only 5 per cent of existing hospitals are completely air-conditioned (although a larger number may have partial air-conditioning), and that about half of new hospitals on the planning boards are being laid out for complete air-conditioning.

Factory air-conditioning, progressing at increasing tempo during the past several years, is due for a big upsurge during 1957, 1958 and the next few years. . .

Estimates of the engineers and architects went as far as to predict that 75 per cent of new factories, and 50 per cent of all factories in the South will be air-conditioned by 1960. But the trend is not confined to the South.

to Page 29→



l o o k . . .

i t ' s

T I T A N O X *

The white coating on these venetian blinds was pigmented with TITANOX-RA—the rutile “pure” titanium dioxide white pigment. Because of its maximum hiding power, TITANOX-RA is especially useful in flexible thin films, on metallic surfaces. On products that must withstand bending or forming—containers, collapsible tubes, etc.—TITANOX-RA is your No. 1 choice in white pigments. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 5; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

*TITANOX is a registered trade mark for Titanium Pigments sold by Titanium Pigment Corporation.

Titanium Pigment Corporation is a subsidiary of National Lead Company

ARI REPORT CONTINUED

Factories in the North, particularly those involving high skills, are either air-conditioned now or are planning future construction which will include air-conditioning.

General refrigeration outlook

In the more established field of commercial and industrial refrigeration, 1956 was paced by the continuing upward trend in frozen and refrigerated food distribution through chain and independent super-markets and the food business in general.

Customer demand for pre-packaged produce has created a whole new trend in merchandising, which calls for more models or types of produce cases. To serve the dairy departments, the new refrigerated adjustable shelf dairy case became a new leader in 1956 and the frozen food business has expanded so rapidly that the open cases in which these foods are merchandised are a big item in the industry picture.

Just as an example—ten years ago the average super-market had about one 8 to 12 foot case for frozen foods. By 1950 they had from 24 to 36 feet, and in the past year more space has been given to frozen food and ice cream than to any other perishable. The industry forecasts that at least 10 per cent of all food store volume will be in frozen foods by 1960—and some estimates even double this percentage.

While these fixtures and cases for merchandising have grown by leaps and bounds—and promise so to continue—the warehousing and storage refrigerating equipment has had to expand—and will have to continue.

In short, the air-conditioning and refrigeration industry had an outstanding year in 1956, and the future looks even brighter.

INDIVIDUAL COMPANY FORECASTS ECHO ASSOCIATION PROPHECIES

Throughout the industries of the appliance and metal products manufacturing field, as well as the supplier industries, the outlook as they individually see it for the period ahead substantiates the thinking proposed by the various heads of the associations concerned. The following comments show the results of the *finish* survey to broaden the forecast picture for 1957.

VACUUM CLEANERS

Alex Lewyt, president of Lewyt Corporation, thinks the industry will sell about 4 million cleaners during 1957, representing an increase of some 400,-

000 over 1956 sales. Drawing on the market survey material prepared by his company's sales department, Lewyt pointed out that there were 2,281,045 marriages in 1956—a great new market for cleaners—with the national marriage rate up some 3.3 percent. "Our dealers are ordering more cleaners than they did last year," Lewyt reported. "These are scheduled for early 1957 delivery."

"We had to survey the market to properly gear our production schedules and enthusiasm is excellent. To meet the expected sales increase the company has invested heavily in new equipment in the Long Island plant that Lewyt purchased from Ford Instrument Co. in 1955. Two new production lines have been formed, each capable of producing a new vacuum cleaner every fifteen seconds," Lewyt said.

DISHWASHERS

The dishwasher industry will sell more than half a million units, during '57, a 25 percent increase over '56, with retail sales for the industry touching at \$150,000,000, predicts Bertram Given, executive vice president of Waste King Corporation. Given credits the industry for giving the dishwasher strong sales, merchandising and promotional pushes at all levels since 1952 with a resulting increase in sales every year. Waste King, a growing factor in the dishwasher market, is best known as the world's largest manufacturer of household and commercial garbage disposers, Given pointed out, and they have had high success teaming them up as a unit for sales, with a single installation needed to put both units into the home, hooked up to the plumbing system.

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SPEE-FLO HOT SPRAY MAGIC DOES IT AGAIN!



Based on actual operating experience from Spee-Flo files.

SPEE-FLO HOT SPRAY HEATERS

720 POLK AVE. • HOUSTON, TEXAS

New surface unit has selective control for all cooking

details and characteristics of new electric range control system explained . . one feature is unique ability to control temperature to allow infinite adjustments to the rate of boiling

by *George Whinery* • PRODUCT ENGINEER, KING-SEELEY CORPORATION

WE are quite prideful in announcing our new automatic all-electric range surface control for electric range surface elements up to 3000 watts. The components for this control system are (a) a positive coefficient senser, located in the center of the range element for contact with the cooking vessel, (b) a responder control switch for proportionately controlling the wattage supplied to the element as a function of senser signal, and (c) a transformer for supplying 15 volts ac to the system.

The control has a voltage regulator built into the control switch. This supplies low constant voltage to the senser and the responder. The wattage to the element may be infinitely selected and will be controlled accurately for maintaining vessel temperature as a function of sensed vessel temperature.

Dual functions explained

For frying, braising, reheating, etc., the control unit functions as a temperature control. A pan of food placed on the controlled burner is quickly heated to cooking temperature and is accurately held at that temperature. For boiling, simmering, stewing, etc., the control unit functions as a power control. The pan of food, placed on the controlled burner, is quickly heated to boiling temperature. Then burner power is reduced to a preselected wattage, maintaining a desired rate of boil. Both types of control are incorporated in the same control system and are regulated by a single knob. The entire system is electrically operated, eliminating the need for mechanical linkages or inner-connecting tubing between the temperature sensing unit and the back panel control unit.

The range of temperature which can be controlled is from 100° F. to 450° F. The boil range is a substantial portion of the dial and gives an infinite selection of power output at the boiling temperature of water, for handling all types of boil. The control is so sensitive that single wattage burners may be used and the lowest temperature setting can be controlled even with the large 2100 watt burners.

Control operation

The control system used in the King-Seeley Controller is unique in its ability to control temperature and allow infinite adjustment of the rate of boiling. The characteristics of the system, which produce this dual control, also reduces pan temperature overshoot tendencies and wide temperature variations after the pre-set temperature is reached.

Rundown of operation

In a cooking operation requiring temperature control, the control knob is set, closing the burner control contacts. The control contacts remain closed until a temperature 25° to 50° F. below the final control temperature is reached. The control contacts then begin to open and close periodically. The contacts are open for a very small portion of the total time, when the action first begins, and remain open for increasingly larger percentages of time as the pan warms through the final 25 to 50° F. range.

When the final temperature is reached, the control contacts remain closed only long enough to provide power sufficient to maintain the pan temperature selected. The gradual re-

duction in heat input to the surface heating element permits the element and pan to approach the same temperature during the final warming period; thus there is no excess heat stored in the surface heating element to cause the pan to reach a temperature higher than the preset temperature.

Additional operating characteristics

If, after control temperature is reached, the pan temperature is decreased by the addition of food to the pan, the control contacts remain closed for a greater percentage of the time, supplying more power to the burner and heat to the pan, thus reheating the pan to the set temperature. The additional heat supplied to the pan is proportional to the difference between the control tempera-

SENSER ELEMENT OF SYSTEM



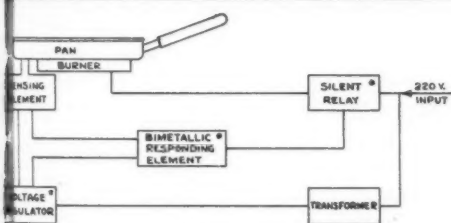
cooking temperatures

ture and the pan temperature after the food is added.

Thus, if a small amount of water is added to a pan full of hot food, lowering the pan temperature only a few degrees, a small additional amount of power will be supplied to the surface heating element to correct the error. If, however, enough cold water is poured into a hot pan to cool the pan 50° to 75°, full power will be applied to the element and the pan will be reheated as though it were full of water when heated initially.

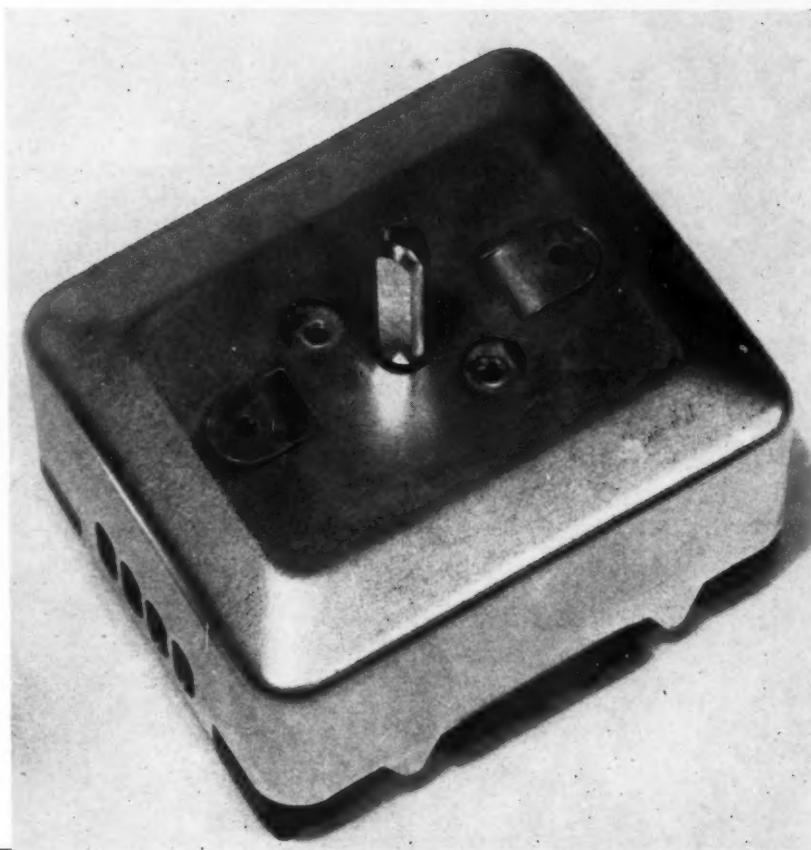
Minute control characteristics

The proportion between the change in power and the difference between pan temperature and control temperature also prevents any significant varia-



tion in pan temperature at the control point. Small changes in temperature cause small changes in element power. The small change in power results in only a small change in the element temperature. Thus, as the pan temperature is corrected for minor variations, the burner remains at a temperature near that of the pan, and stored heat in the surface heating element cannot cause over-correction.

Cooking involves a similar operation of the control unit. Again, the knob is set, and the control contacts close supplying full power to the surface element for rapid heating of the pan. However, when the boiling point of the water is reached, the action of the control contacts depends upon the knob setting. If



COMPLETED ASSEMBLY OF CONTROL UNIT IS SHOWN IN ABOVE PICTURE

the knob is set for low boil, the unit behaves in a fashion similar to that during regular temperature control operations. Power is reduced gradually through the last 50° F. of heating and when the pan reaches the boiling temperature, only enough power is supplied to maintain a low boil.

Boiling control set-up

If the knob is set for medium boil, the contacts do not begin to open until the pan is within approximately 25° F. of the boiling temperature, and when the pan reaches boiling temperatures, the power remains at a higher value, causing the water in the pan to boil more vigorously.

At the high boil setting, power is not reduced at all. The contacts are set to open at a temperature above 212° F. and thus never begin to open when the pan temperature is limited to 212° F. by the boiling water. As the control is continuous, the unit can be set for any point between low and high boil to produce any power between the value required to maintain a very light boil or simmer and the full wattage of the burner. An infinite range of power

is thus available over the boil range to produce maximum flexibility of control.

The control system

The control system is entirely electric and involves no mechanical or hydraulic thermostatic elements. The elements used in the control are based on designs tested and in use. These elements have proven to be reliable, accurate, and extremely sensitive in their individual applications and are combined in the range burner surface control to give equally satisfying results.

The sensing element consists of a special, high temperature coefficient of resistance wire embedded in a small diameter aluminum pellet. The pellet is spring loaded against the bottom of the pan on the surface heating element. The pellet is connected to the control unit by two small diameter wires. The unique design of this pellet results in an almost instantaneous change in resistance of the wire in the pellet as the pan temperature changes.

This change in resistance is con-

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Record turnout, visitors and displays for 21st Annual "Pageant of Vending"

**steady growth of vending machine industry noted at meet; will reach
\$1.9 billion in sales and service by end of '56, association reports**

WITH record highs in both attendance and exhibitions, William C. McConnell, Jr., general chairman of the 1956 convention and exhibit of the National Automatic Merchandising Assn. called the 21st annual meeting to order, Dec. 3 in Chicago's Conrad Hilton. The four day meeting started with a surge of activity and continued throughout the four days, riding on an atmosphere of confidence with new records in sales reported for the year. Approximately 1.9 billion worth of products and services sold by an estimated 3,217,000 vending machines by the end of 1956, the association officials estimated at outset of the meet.

Representing the full range from supplies through the new models in vending machines, 191 exhibitors set up their booths in the hotel for the convention, filling the hotel's exhibition area and spilling over into two other floors of the hotel.

Association president opens meet

After the introduction of association founders and past presidents, John T. Pierson of the Vendo Co., president of NAMA opened the general session with a report on "Automation comes to Distribution." Following his report, a panel spoke on "A Blueprint for Automatic Feeding Service."

Coordinator was J. F. Wanink, Automatic Merchandising Co., and John W. Mock, management consultant, served as moderator. Panel members included

Douglas Moore, Davidson Brothers, Inc., speaking on "Planning and Sales"; Joel Kleiman, Automatic Canteen Co. of America, speaking on "Physical Preparations for Service"; and Marcus Kaplan, Select-O-Mat of Virginia, speaking on "Operating Problems".

"Maturity of the industry . . ."

Following this discussion, C. W. Millman, Automatic Merchandising Corp., spoke on the "Maturity of the Automatic Merchandising Industry," concluding the first day's session.

Tuesday sessions began with William F. Courtney, Jr., Automatic Refreshman Co., 1956 Convention Program Committee Chairman, presiding. William C. Miller, Jr., Chief Food Sanitation Section, U. S. Public Health Service, spoke on "Your Newest Partner; The U. S. Public Health Service Sanitation Code." A discussion on "Equipment Needs for the Future", had Bert Steir, Automatic Merchandising Corp., as coordinator, with John Mock as moderator. Panel members included William S. Fishman, Automatic Merchandising Co., H. A. Beiger of Geiger Automatic Sales Co., and George Duckett, of the G. B. Macke Corp. The morning session concluded with the presentation of the 1957 NAMA officers and the presentation of the John S. Mill Memorial Award.

Wednesday's general sessions were called to order by W. T. Collett, Tibbals Co., vice chairman of the 1956 con-

vention program committee. The first was a panel speaking on the subject "Your Customer Speaking." John W. Mock was moderator, and Panel members included George Berteau, Director of personnel, American Motors Co.; Mr. Hildegard Greenwaldt, general manager, Employees club, Falk Corp.; Mrs. Harriet Hays, Director of Food Service, Board of Education, Dayton, Ohio; Melvin F. Ogram, Assistant-secretary-treasurer, General Fireproofing Co. and W. Robertson, manager of the Information Bureau, John Hancock Mutual Life Insurance Co.

"Do you hire . . and then fire?"

The next speech was presented by Paul J. Mundie, partner of Humber, Mundie, and McClary, speaking on "Do You Hire . . And Then Fire?" Following his speech, presentation of the 1956 membership building contest awards (the Bernard J. Scheuer Memorial Award) were made by Ernest H. Fox, Autin Packing Co., chairman of the 1956 membership building committee. Following the award presentation, Fred Smith of Fred Smith Associates spoke on "Selling is Serving". Wednesday night entertainment was the annual banquet in the Conrad Hilton Grand Ballroom.


Throughout the session, a program for the ladies of the exhibitors and conventioners, was held, with special programs set up each day and provided with the assistance of member organizations.



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by
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Pride in product is perhaps the strongest reason for Follansbee's reputation in the industry as, "A Quality Producer of Cold Rolled Strip." And Follansbee mill operators are not satisfied until every specification on every order is met *exactly*.

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FOLLANSBEE, WEST VIRGINIA

Cold Rolled Strip • Seamless Terne Roll Roofing • Polished Blue Sheets and Coils

Sales Offices in Principal Cities

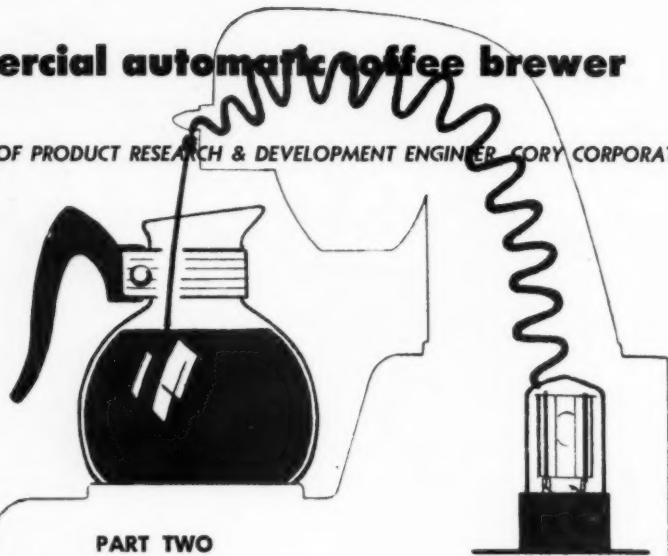
Cory's all new commercial automatic coffee brewer

by *Harvey Karlen* • CHIEF OF PRODUCT RESEARCH & DEVELOPMENT ENGINEER, CORY CORPORATION

THE hot plate circuit for both the Cory C500 unit, the C100, and the smaller C115 model are identical basically, varying only in number of stations. Three are medium low heat brick and wire element assemblies. One is a low-heat-only brick and wire element assembly, and one is a high/low heat sealed element assembly. All resistance wire and ceramic brick assemblies are covered with chromium plated steel covers.

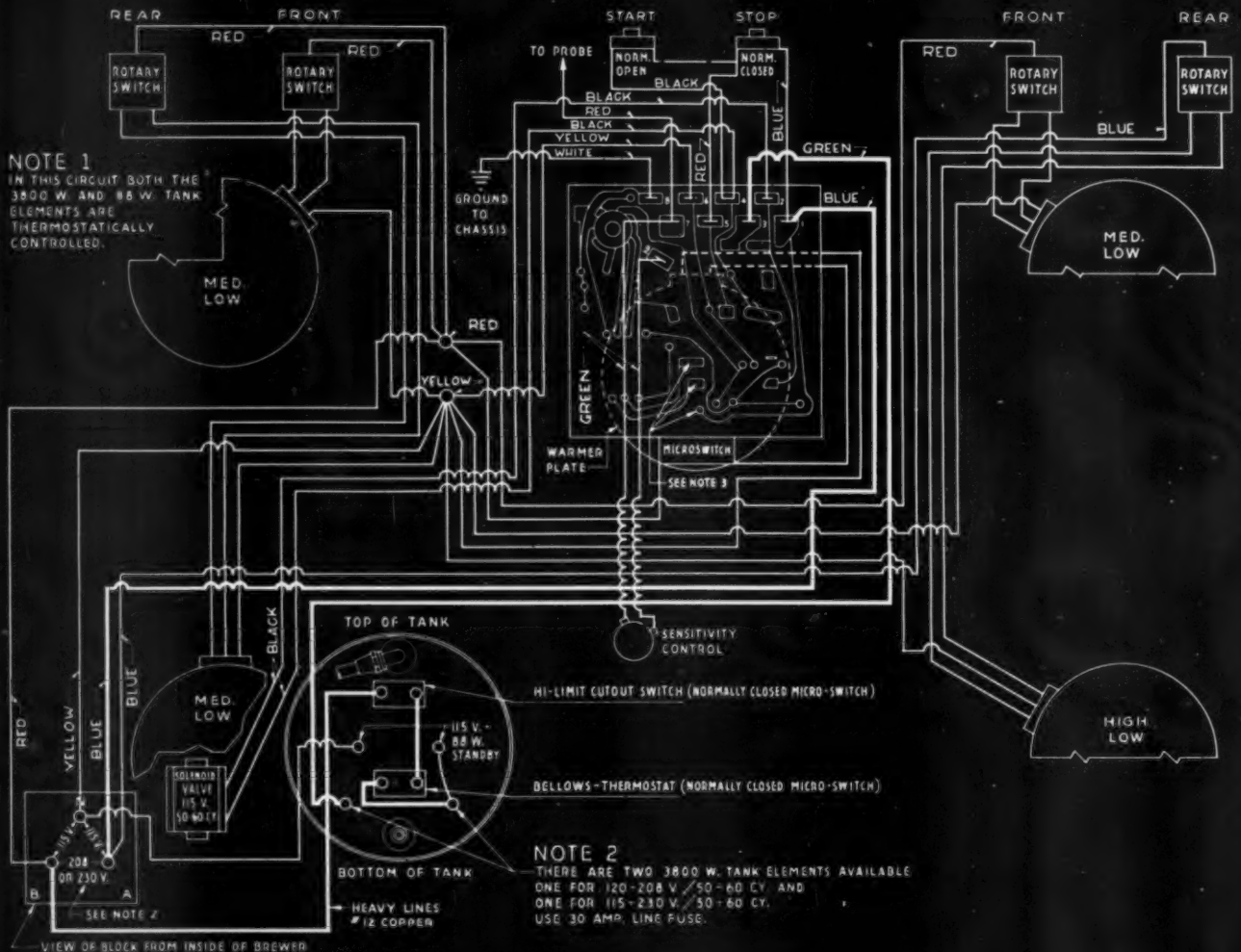
With the exception of the low-heat-only element, all are controlled manually by means of four rotary type switches mounted on the front panel of the unit.

Three of the manually controlled elements (medium; low) comprise a circuit using 115 volts by tapping two terminals on the main junction block having three terminals: Two high voltage terminals and one neutral. 115 volts is secured



PART TWO

A radio tube and a printed circuit team up to provide new look in commercial design, and create optimum control of brewing operations with greater service economy

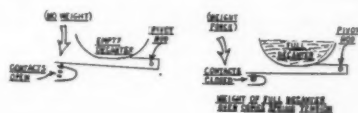


by tapping one high voltage terminal and the neutral terminal. The high/low heat element also uses a 115 volt supply, but is tapped off of the remaining terminal and the neutral terminal.

Reason for low-heat element

The low-heat-only element is located underneath the center plate at the station where the empty decanter is placed for the brewing cycle. Its primary purpose is to keep the freshly brewed coffee at the proper serving temperature.

The current flow to this element is controlled by an open switch which in turn, is controlled by the position of the center plate. This plate is controlled by weight of the water in the decanter resting upon it. The complete assembly mounts upon a tray hinged on one end,



by a pivot rod. The opposite end rests on an insulated stud mounted in the end of a curved spring.

As the decanter fills, becoming heavier, its weight overcomes the tension of the curved spring, forcing the stud to contact the actuating lever that trips the normally open microswitch, thereby closing the circuit, allowing the current to flow through the element. Removing the decanter immediately causes the electrical circuit to be broken by returning the microswitch to its normally open position. Down travel of the tray is limited, preventing excessive over travel on the switch mechanism. Sketch B-2 illustrates.

Assembly operations at Cory

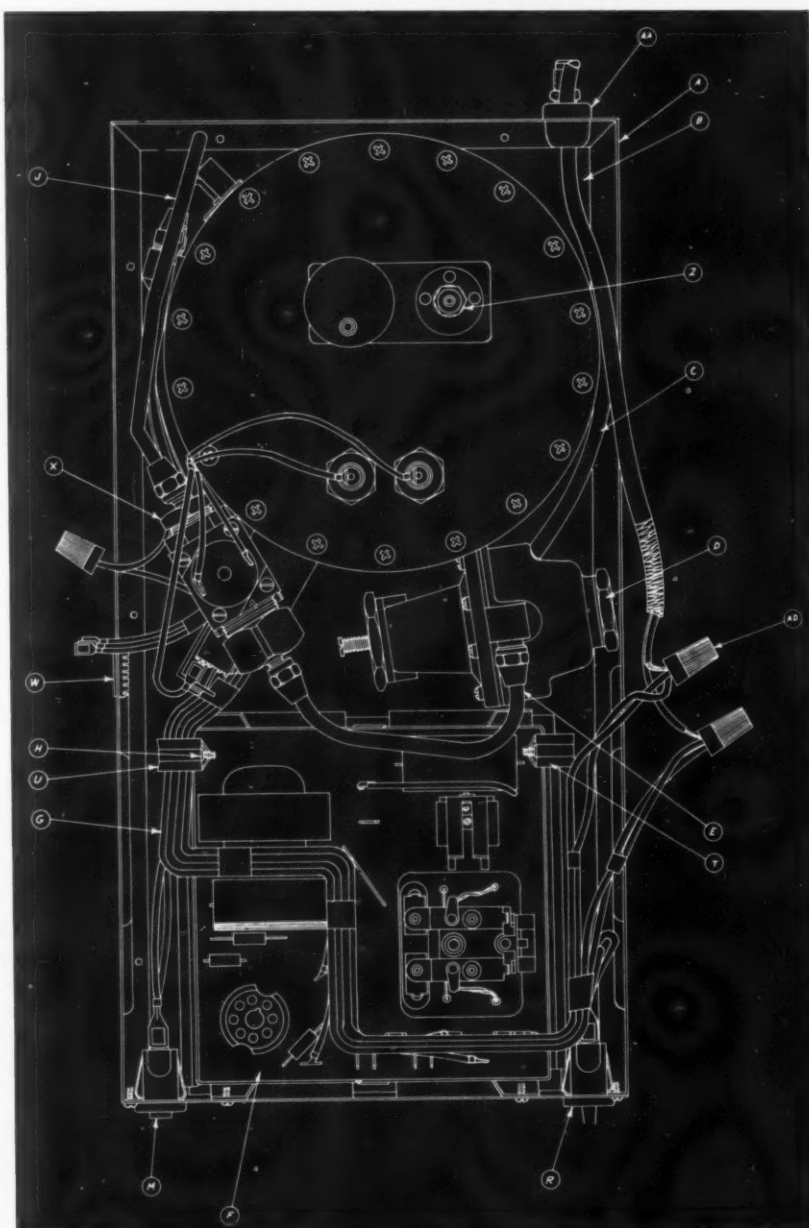
As should be expected with this type of unit, the assembly and manufacturing operations are made up of a number of sub-assemblies which greatly speed up the operation of the final assembly. Accompanying pictures show different phases of the operation. Main parts of the final product, the water tank and its affiliated controls, the printed circuit assembly, the heat stations, etc., are made up in sub-assemblies and then are fed to the main assembly line where the coded wiring harness is affixed and fitted into the stainless steel cabinet and the subassembled parts hooked up and fixed into place.

Complete operational inspection

All assembled units are given a complete operational check consisting of a complete cycle using real coffee and three additional operational cycle tests

finish JANUARY • 1957

ASSEMBLY PLAN FOR NEW COMMERCIAL UNIT



SKETCH B-2

LOWER ASSEMBLY FOR THE C115 is shown in the blueprint above. Keys and identification are (A) wraparound, (B) plate for bottom assembly, (C) water line assembly tube, (D) regulator pressure and connector assembly, (E) pressure regulator tube to solenoid assembly, (F) electronic assembly control, (G) wire loom, (H) cadmium metal screw, (J), solenoid to tank assembly tube, (M) pilot light, (R) switch, sp-st, (T) and (U) clamps, (W) plug button, (X) valve solenoid assembly, (Z) half union, (AA) strain relief, (AD) wire nuts. On the facing page is a wiring diagram for the CH500, which is similar to that used in the C115, the only variance being that it is a double unit with more stations.

during which the brewer is checked for proper functioning on both high and low water pressures. The water temperature at the cartridge spout is recorded during the operational checks and final ad-

justments are made to the pressure regulator to insure the correct infusion time. From the testing section, the units are individually packaged and then transported to the warehouse facilities.

FORECASTS CONTINUED

"More and more dealers and builders are selling the two appliances as a package," Given said, predicting this trend will accelerate during the rest of the year.

WATER PUMP SYSTEMS

Farm and home modernization will play an important part in the progress of the members of the National Assn. of Domestic and Farm Pump Mfrs., Walter F. Deming, head of Deming Co., Salem, O., and president of the Assn., predicts. A strong selling program is now underway for 1957, bolstered by a hard-hitting promotional campaign in the spring and another in the fall. This should suffice to keep water systems moving steadily through normal distribution channels to the customer, Deming reported. The modernization market represents a challenge to the pump industry in terms of more than a quarter of a million prospective water system customers. "We cannot hope to accomplish full saturation of this market potential in 1957," he said, "but our industry will make every effort to do so."

ELECTRIC PRODUCTS

Westinghouse sales in 1957 are expected to set a new record, the result of a vigorous planning, programming and promotion program in 1956, Gwilym A. Price, chairman and president of Westinghouse Electric Corp., has reported. Bolstering the prospect of record sales are the predictions, Price pointed out, "that the nation's over-all output of goods and services during the year will continue at better than a 3 percent annual increase and reach 420 million dollars."

HOUSEHOLD FURNISHINGS

Heralding a later result in increased consumer sales, General Lawrence H. Whiting, president of the American Furniture Mart, Chicago, has predicted an attendance of 45,000 buyers and sellers for the 1957 Winter market, "In that period," Whiting reported, "the industry should gain in volume at least 3 percent, with the current boom in business generally hitting a new high." One indication of increased buyer interest in the market is the Canadian buyer registration which is 63% over last year, with domestic registrations also running well ahead of 1956."

AIR CONDITIONERS







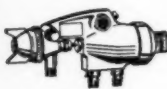






"Our air conditioner production schedules for the first quarter of '57 will

exceed our total room cooler sales in the full year of 1956," Ross D. Siragusa, president of Admiral Corp., has announced. Predicting higher sales and profits for Admiral throughout '57, Siragusa estimated that the company will produce and sell 10 percent more appliances, refrigerators, freezers, room air conditioners, and electric ranges than it did in 1956. "The shakedown in the TV-appliance industry during the past year has resulted in over a score of companies merging or halting production," Siragusa said. "This can only

mean one thing for the years ahead—more business and greater profits for the sound, well-financed companies that have survived the tremendous competitive pressures in 1956.

RADIO AND TELEVISION

Admiral's Siragusa also drew the 1957 picture for television and radios, predicting that the entire industry may reach a record 9,000,000 units in 1957. Nearly half of these, Siragusa said, will be in the 10, 14, and 17 inch portable models. Color TV should continue to

PRODUCTION FINISHING	 Model 18	 Model 7
GENERAL FINISHING	 Model 19	 Model 29
TOUCH-UP	 Model 26	 Model 10
AUTOMATIC APPLICATION	 Model 21	 Model 11
HEAVY FLUIDS & COATINGS	 Model 7E2	 Model 18
SPECIAL PURPOSE	 Model 171 flocking	 Model 190 dusting-drying
		 Model 31 flow gun

grow steadily with sales estimated at nearly half a million units, he said. "Radio sales were excellent in '56, and we foresee an increase of 5 percent next year, due largely to the popularity of the new pocket transistor models. The movement of high fidelity phonographs should continue to show relatively sharp gains because that market still has low saturation," Sirargusa concluded.

STEEL SALES

"We expect that the steel industry will make and sell more steel in 1957 than

ever before in its history," R. L. Gray, president of the Armco Steel Corp., has predicted. Gray pointed out that his company's confidence in the continuing growth of the nation is reflected in their plan to spend about \$120 million in 1957 for improvements and expansion. Gray also noted that, in 1957 and the years following, the emphasis on research in the industry will continue to mount. This is the result of the constantly rising cost of steel making, he said, which has spurred the industry to invest more and more time and money

in the search for more efficient methods of production. "Never in history has there been greater concentration on the development of simpler, less costly production processes."

HOME LAUNDRY APPLIANCE

Sales for the home laundry equipment manufacturers should reach a record 6,425,000 units in 1957, Guenther Baumgart, executive director of the American Home Laundry Manufacturers Assn., has announced. This forecast was projected by the industry's top market research analysts. 1956 sales were a 9 percent increase over 1955, Baumgart announced, with approximately 6,227,000 washers, dryers, and ironers sold.

THE TOTAL PICTURE

"The economic outlook is clouded by rising production costs, stagnant profits," Ernest G. Swigert, president of the Hyster Co., Portland, Oregon, announced in his year end statement. "The nation achieved new high levels of economic activity in 1956, and the impetus can be expected to carry business along at a high rate for at least the first months of the coming year." However, the business outlook for the remainder of '57 and beyond, is somewhat clouded by two factors—rising production costs and the fact that profits have not shared the economic advance seen on other fronts.

GARBAGE DISPOSERS

Bertram Given, executive vice president of Waste King Corporation, Los Angeles, manufacturer of household and commercial garbage disposers, predicts that total industry sales will hit 650,000 units this year—18 per cent over the record reached in 1956. Estimated cost is approximately \$52 million at retail.

Given also expects sales of food waste disposers to increase from 20 to 25 per cent each succeeding year until they reach 10 per cent saturation of their potential national market.

METAL PRODUCTS

A record backlog of \$1.5 million was reported for the Bettinger Corporation, Waltham, Mass., by Robert A. Weaver, Jr., president, at a director's meeting. In addition to citing the all time high backlog, Weaver said that Bettinger, a leading producer of ceramic-coated products, would exceed its earlier estimate of 40c a share earnings in 1956, also a record figure for the company.

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will apply your
finishes or coatings...
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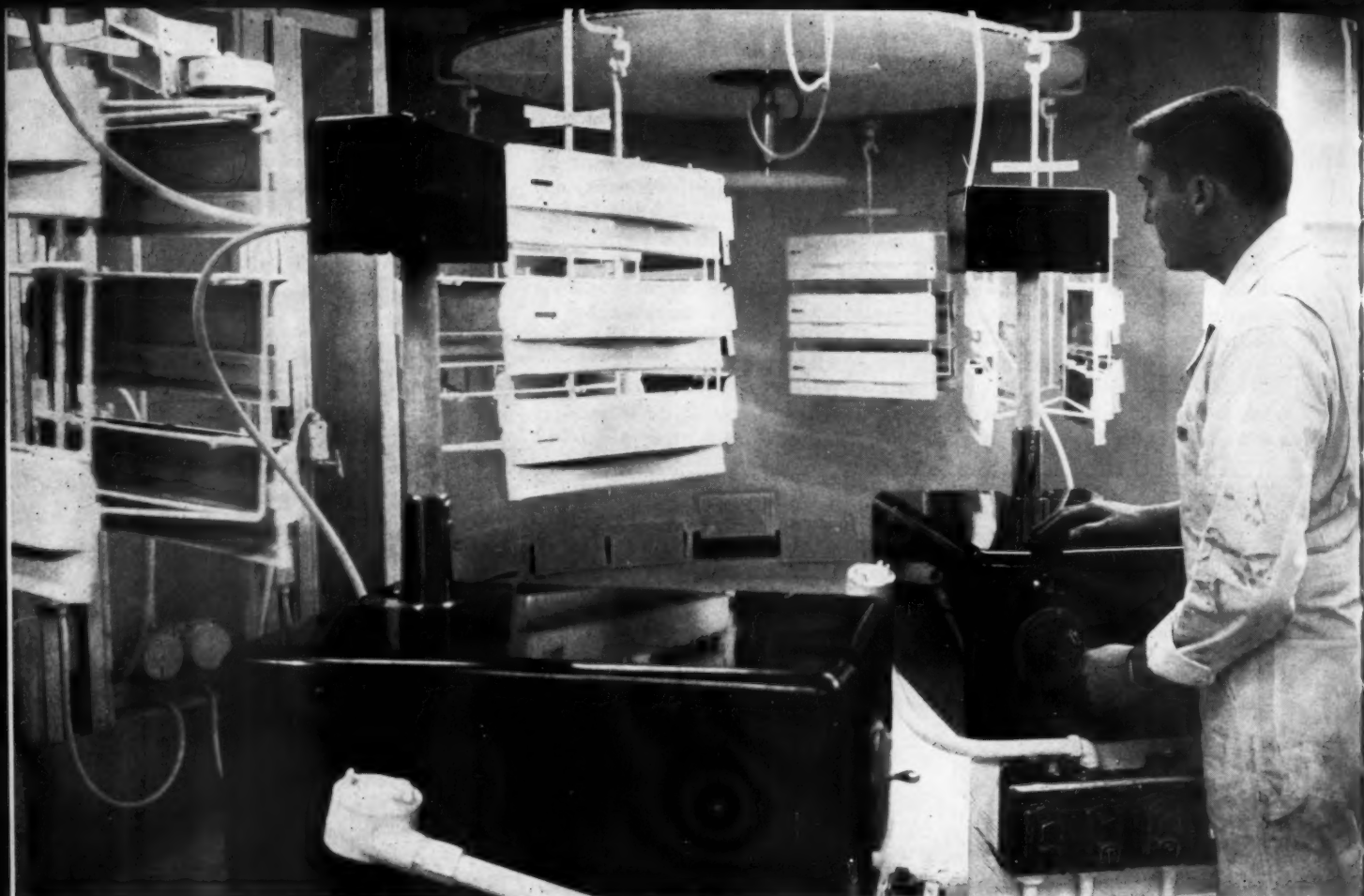


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Whirlpool's new dryer finishing system

latest method uses flow undercoat plus electrostatic finishing coat for home laundry dryer cabinets-components: results in new beauty in finishes

by Henry Kowalski • MANAGER OF MANUFACTURING, MARION DIVISION, WHIRLPOOL-SEEGER CORP.

RAPID but high quality finishing of home laundry dryers is achieved with marked economy by an ultra modern system installed in the new Marion, Ohio, plant of the Whirlpool-Seeger Corporation. This system is used on major and on some lesser components for Sears-Kenmore and Whirlpool dryers, produced from sheet steel on a high production basis.

High economy is attained partly by keeping direct labor at a minimum and partly by employing a flowed-on undercoat and a finishing coat applied by the latest form of electrostatic spraying system. Great advantages of the system are that there are virtually no losses in overspray; uniform covering is attained and labor charges are extremely low.

Human variables are nearly eliminated; no water curtains are needed; no reclaiming of sprayed finish is required and only infrequent cleaning of booths is necessary.

These economies, however, are far from being at the expense of finish quality for it is held at a high level and is considered at least the equal of any two-coat system in general use for products of this type. Coatings are applied, not only to the cabinet exterior and to other external parts, but to such internal parts as the drum in which the drying is done and to its supporting bulk and head and base.

All parts that receive the finishing here described are first put through a seven-stage spray cleaning and phos-

phatizing system that includes thorough cleaning and rinsing, phosphatizing, a dilute chromic acid spray, rinsing in deionized water and forced drying the parts before priming. This treatment takes place in a 650-ft tunnel and provides a phosphate surface that is rust resistant and also helps to insure high adherence of the coating, despite the adverse conditions of heat and moisture encountered in service.

Flow coating the primer

After drying and cooling the parts, they enter a 6-ft flow coating booth. Coating is done by jets of primer that are directed at many angles and from all sides so as to reach all surfaces both internal and external. All parts are set,

of course, so that the modified epoxy resin type primer that does not adhere to surfaces as a coating will drain off and not collect in pockets. This primer is recirculated and is checked frequently to be sure that 18 to 19- sec. viscosity (as measured by a No. 4 Ford cup) at room temperature is maintained, solvent being added as needed.

Drain off in vapor

Primer that drains off flows back to the supply tank during a 10-min. transit through a vapor tunnel that is 135 ft. long and is held at room temperature. Then, the parts enter an oven for a 20-min. bake at 280° F. Control is such that the film of primer is held between 0.0006 and 0.0012 in. thickness.

After cooling, parts are transferred to racks on the chain conveyor that serves the finishing line and proceed through a touch-up sanding booth in which a strong down draft is maintained to remove dust. Only areas having defects in the primer coat are touched up by the vibrating sanders used. Then the parts pass through a booth in which vibrating nozzles discharge compressed air that blows off dust particles.

All parts that are to pass through the electrostatic spray booth are arranged on racks, so that they present all surfaces to be coated to the spray in a manner similar to that of the main housing of the dryer, which is the largest unit. This arrangement tends to minimize overspray and to effect a uniform deposit on the surfaces on which the coating is needed and especially those exposed to view in the assembled dryer.

There is some deposit on back surfaces but it is minimized because these surfaces normally are hidden in service and receive ample protection by the primer coating. Although cabinets are rectangular, there is a large opening in the rear wall and this usually is covered by smaller parts during spray coating so that there is no excess of spray on the inner walls.

Before racks of parts enter the electrostatic spray booth, exposed surfaces to be finished are wiped with a tack rag to remove any remaining dust particles such as might cause blemishes in the final coat. Booths and the conveyor arrangement therein are such that each rack travels around a loop in passing each spray head. This route is pro-

vided partly because the spray is thrown outward around the whole periphery of the spinning disc applicator.

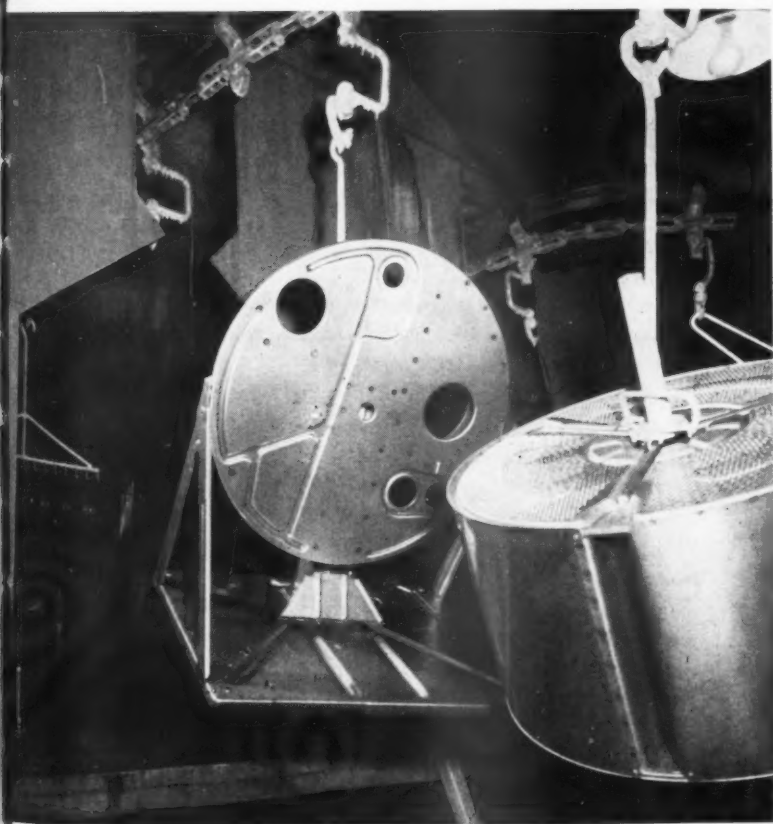
Four booth electrostatic system

Each rack carries above the load a pair of crossed bars that contact wheels as the rack passes and this indexes the rack 90° about its swivel carrier to bring the desired surfaces of parts into best position to receive the spray. To effect proper delivery of the spray to surfaces to be coated, the 20-in. disc is not only rotated at 800 rpm but is reciprocated vertically. This is done to help coat each surface uniformly from top to bottom of each piece regardless of its position on the rack.

Four heads are used. There is one disc for each of four booths that are traversed in series, the racks being indexed 90° between booths so that a different surface is toward the disc in each booth. These are arranged in cloverleaf pattern to conserve space. Booths receive a uniform supply of filtered air and are kept under positive pressure so that all entering air flows outward.

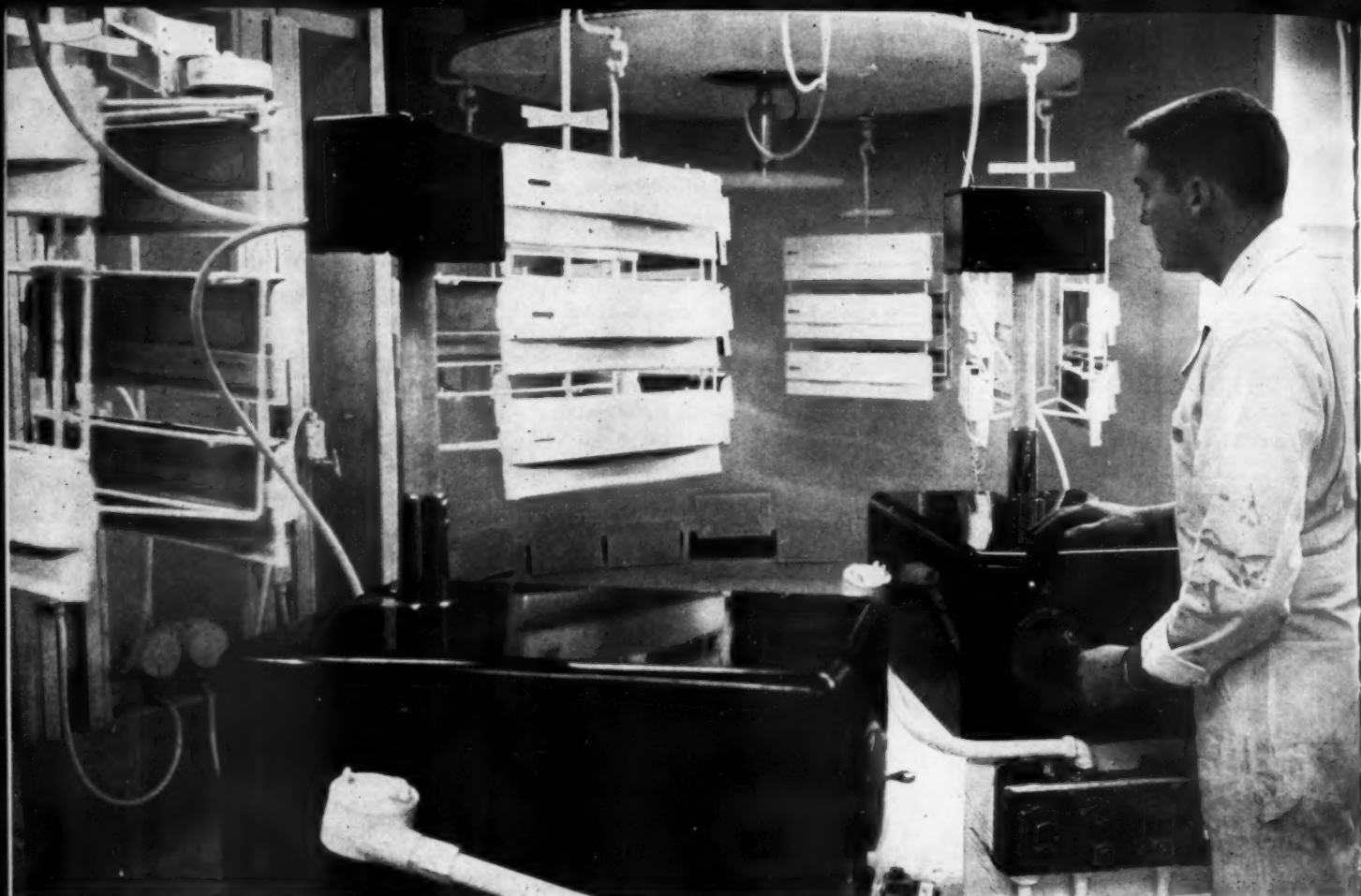
Enamel used is an alkyd urea

TOUCH-UP is done with vibrator sanders as the dryer components flow from the ovens on way to electrostatic section.



CLEANED AND PHOSPHATIZED dryer components entering the booth where to apply the primer flow coat in the system developed at the Marion, O., plant. After the parts have been drained, they continue on through the baking oven.





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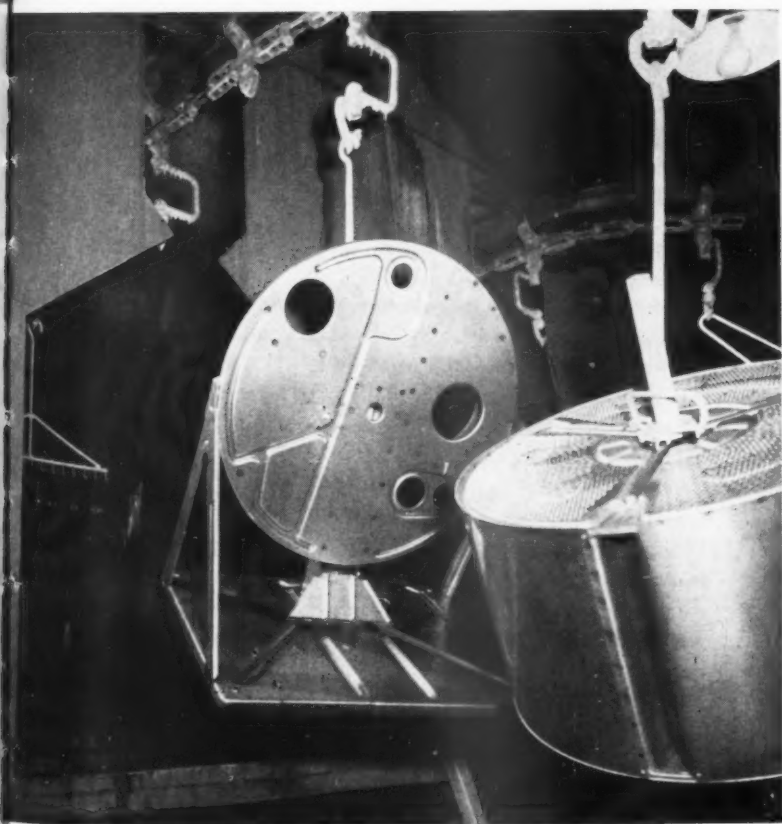
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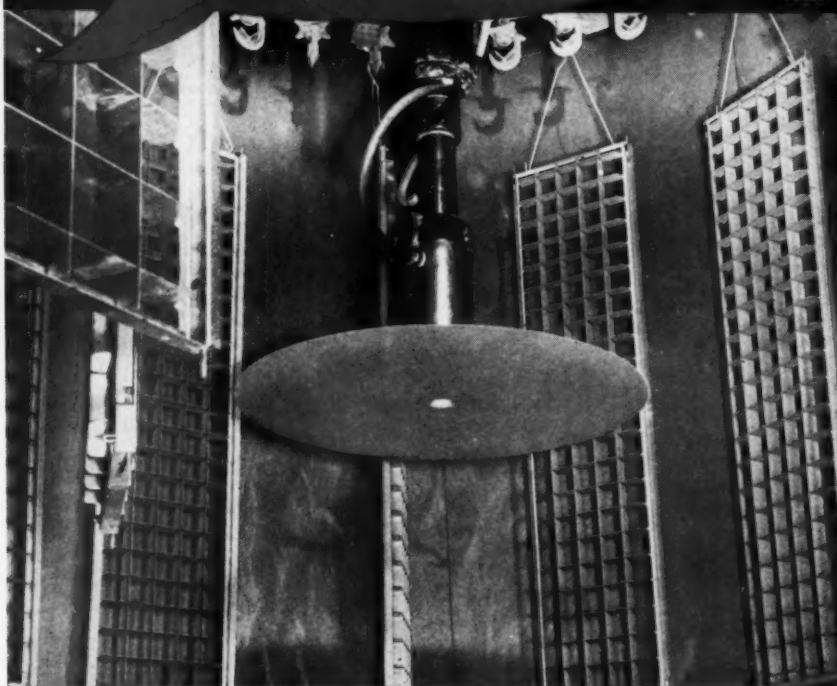


CLEANED AND PHOSPHATIZED dryer components entering the booth where they apply the primer flow coat in the system developed at the Marion, O., plant. After the parts have been drained, they continue on through the baking oven.



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A typical example is Melrose Lighting Company, Philadelphia. They make industrial fluorescent lighting fixtures and employ only 25 people.

Formerly, according to F. Homer Hagaman, owner Melrose Lighting, when their fixture louvers were hand sprayed, they painted only 70 pieces per hour. Now, with Ransburg Electro-Spray, he reports they get over 200 per hour.

Production on the fixture end parts jumped from 400 pieces per hour by hand spray to over 2000 an hour electrostatically—a 400% increase!

Along with improving quality of the work, stepping up production, and cutting labor costs, Melrose is enjoying a 50% paint savings.

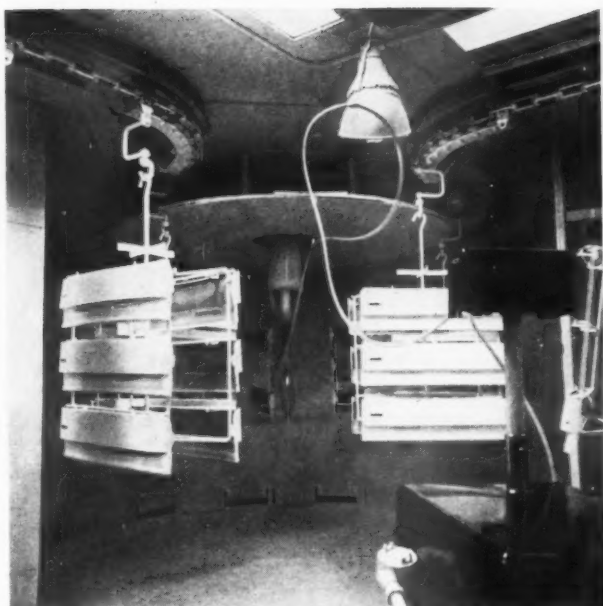
Let us show you how Ransburg No. 2 Process can lower **YOUR** painting costs. Write for our new No. 2 Process brochure on electrostatic spray painting. Numerous production-line examples show how other manufacturers are cutting finishing costs . . . increasing production . . . and improving the uniformity and quality of their work with Ransburg equipment.

Ransburg

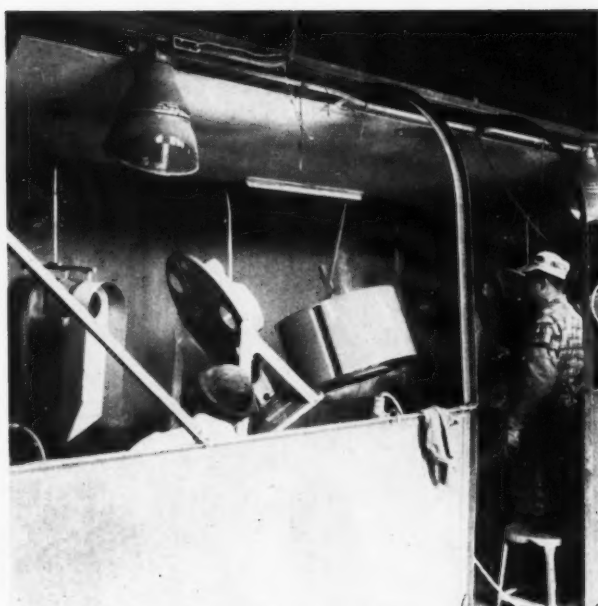
ELECTRO-COATING CORP.

Indianapolis 7, Indiana

RANSBURG



CLOSE-UP of one of the four electrostatic spray booths which are arranged in cloverleaf pattern. Cabinets and components from the primer coat oven are fed to system.



TOUCH-UP is done with conventional spray guns in this water curtained booth. This is needed for nonsymmetrical parts, not uniformly coated in earlier operation.

FINISHING SYSTEM CONTINUED

(Melamine) type with formaldehyde modification and its viscosity is held constant (16 sec. in No. 4 Ford cup) by blending with zyloltoluol solvent in the high flash range. Feed is adjusted to apply about 11 cc per sq. ft. of surface coated and this results in a film 0.0006 to 0.0008 in. thick.

Although cabinets, for which the electrostatic booths are primarily designed, receive a uniform coat, some other parts, that are not symmetrical and cannot be hung in such favorable position with respect to surfaces to be coated, are not uniformly coated in the same setup. Consequently, some touch-up spraying with conventional hand

held spray guns is needed. This spraying is done in a water curtained booth but the amount of enamel applied there is small as compared with that applied electrostatically.

Spraying 360 to 440 racks per hour

From 180 to 220 dryer cabinets are sprayed electrostatically per hour and about the same number of racks of other parts can be run out but each of these racks hold several parts. All parts that receive the finishing coat are carried through an oven in which they are baked for 20 min. at 325° F. After emerging from the oven, all parts pass through an inspection area and those rejected for defects are sanded and rerun.

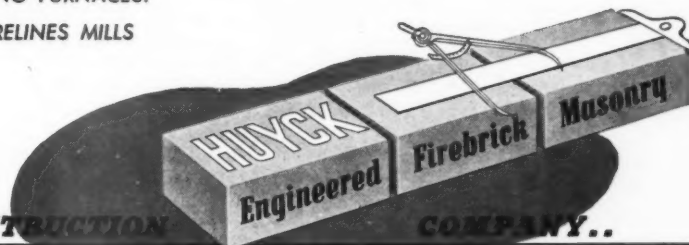
At present, reruns are below 10 per cent and they are expected to be below 5 per cent as further experience refines the practices followed. Parts that pass inspection remain on the conveyor for two hours before they reach the assembly area or are put into temporary storage.

Enamel for spraying is prepared in a separate mixing room from which the finish is pumped to spray equipment as needed. Frequent checks are made to insure uniform viscosity at the point of use. Net results of care in the selection, mixing and application of the finish, and of good metal preparation practices, are to insure a high grade of finish and one having excellent service characteristics.

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APOLLO Pre-Finished Metals can easily be worked by standard sheet metal and machine shop cutting and forming methods. They are uniform in quality, easy to weld, scratch-free, rust-proof and tarnish resistant.

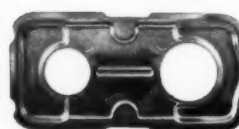
In addition, APOLLO offers special design services to assist you in getting the maximum advantages from Pre-Finished Metals. Professional sketches, economically adapting APOLLO improvements to your current or planned products, are available without obligation. You'll be surprised at the variety of decorative effects and practical advantages that can be obtained through a little advance planning.

Pre-Finished Metals can lower your production costs, step-up production and help sell your products. Ask APOLLO for full details.

Apollo METAL WORKS

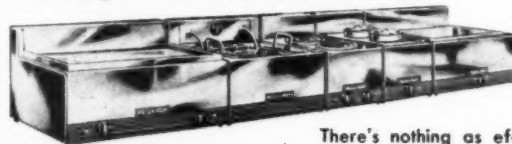
These typical examples show how APOLLO Pre-Finished Metals help to sell at greater profit per unit

Attractive hardware items in unlimited variety are being manufactured more economically and faster from APOLLO Pre-Finished Brass and Bronze. Available pre-polished and pre-enameled, or pre-finished with bright or satin chrome, the uniform beauty of these parts cannot be equalled by costly piece finishing.



Aerator pans, oven and rotisserie linings, back rail trim, stove doors and tops and broiler pans are customer appealing, sales creating features when made from APOLLO

satin or bright finished tarnish-resistant ChromSteel.



There's nothing as effective as the gleaming appearance of APOLLO Pre-Finished ChromSteel to sell certain types of food service equipment. Sturdy, tarnish-resistant, easy to work, weldable, APOLLO ChromSteel permits a finer job at a fraction of the cost of piece finishing, while greatly increasing production.



APOLLO Satin-Finished BrasSteel is ideal for radio, Hi-Fi and TV cabinet trim, control panels and hardware. Pre-finished surface allows

embossing, patterning and silk-screening operations to be performed before forming...cuts costs...saves time.

Manufacturers of decorator items like the way APOLLO Pre-Finished Brass and CopperSteel cut finishing and plating costs. Their products are more distinctive and attractive, too—possessing the gleaming appeal that makes them "best-sellers."



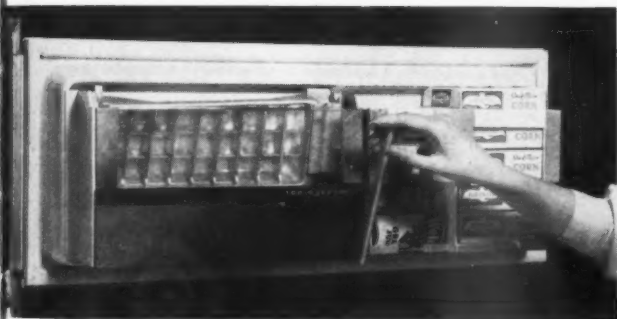
6684 S. OAK PARK AVE.
CHICAGO 38, ILLINOIS

Greater color use, metal trim are significant changes noted in 1957 appliances

Newer finishes, increased use of color, and metal trim are readily apparent in the new offerings of the appliance and metal products manufacturers. Working for a greater simplicity in appearance, the designers have leaned more toward color, and toward stainless steel and aluminum, both clear and anodized, for exterior and interior appearance appeal. On the following pages, *finish* presents a pictorial display of what you'll be seeing on the floor at the January market and in dealer's showrooms and in homes across the breadth of the land in the next few weeks.



General Electric's new models achieve the "built-in" look without need for expensive remodeling. Flat panels, straight corners and lines give the new models an eye pleasing "architectural look."



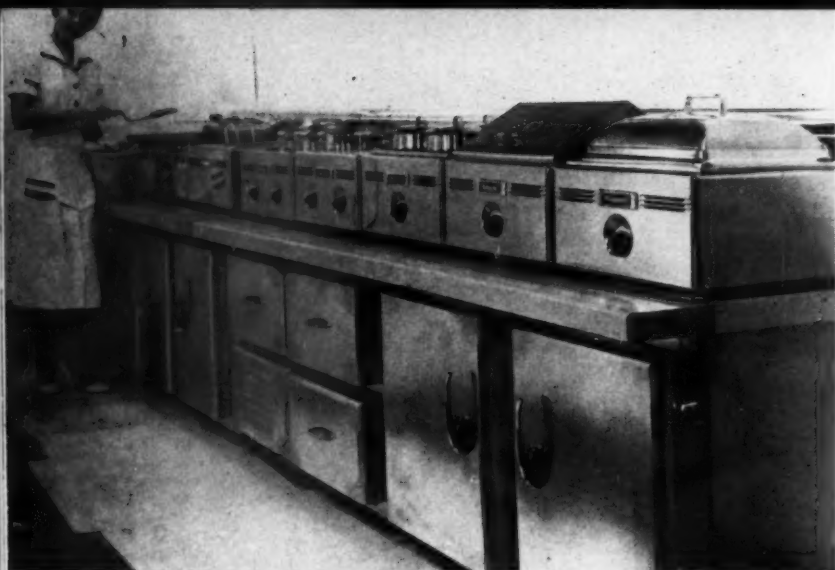
Frigidaire's new built-in ejector, that cascades a full tray of ice cubes into a basket ready for serving with a touch of a lever, is one of the new '57 ideas.



Ruud's newest, a 16 gallon solid aluminum alloy tank, combines high btu output (95, 200 btu per hour) with a size that easily adapts it for under-the-counter, and special "little-room-needed" locations.



Western-Holly's rotary barbecue-broil oven—large enough to crisp barbecue a 25 lb. turkey—features the "built-in" design which the California maker pioneered. Oven is completely porcelain enameled.



Foster's new line of counter refrigerators are of welded all-aluminum, that, with the addition of modern electric cooking units, become self-contained kitchens. Set-up is particularly valuable where space is scarce.



Amana's new slim-lo roomaire conditioners feature a woven decorator fabric front, five control settings, jet cooling system, Amana's activated charcoal filtering system and has a new 15½" depth.

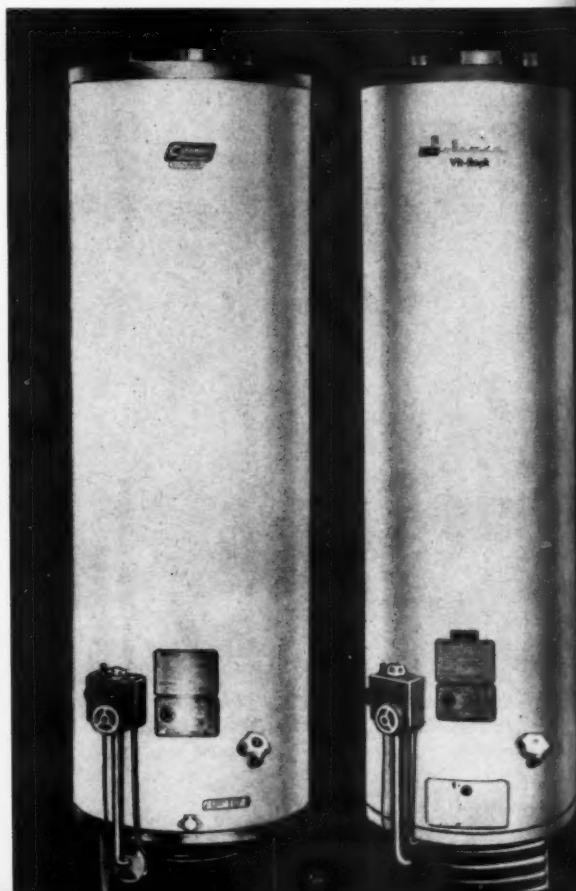
Monarch's deluxe electric ranges for '57 include rotisserie accessories, king size temperature controlled surface units, and Monarch's provides means for cooking an entire meal on one burner.



American-Standard's new food waste disposer features vibrationless, compact design with continuous feed operation. One feature is size: 10¾" high, 7½" diameter and weight, 25 lbs., making it ideal for remodeling jobs.



Coleman's new "standard" line of economy priced gas water heaters have been completely re-styled and improved. Heaters are available in galvanized and "vit rock" lined tanks with new control grouping.

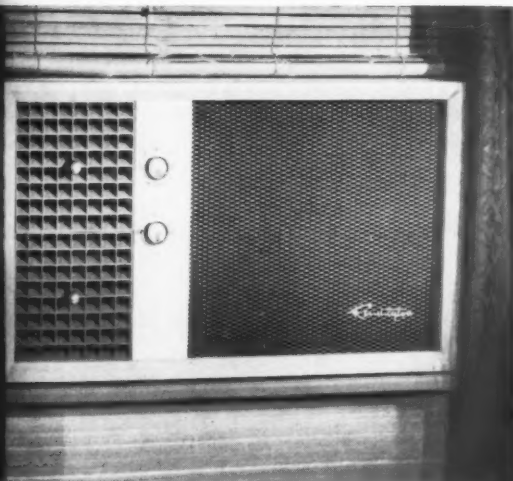




Reo's new 25-inch ride-a-lawn has forward and reverse with extra wide tread tires and a totally enclosed drive. Optional wing cutting units extend width 50 per cent—a unit for '57 that makes lawn cutting "almost nice."

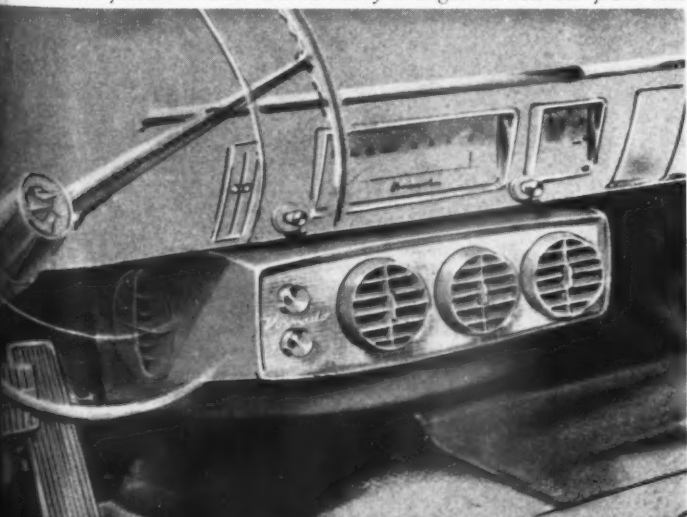


Universal's new automatic gas dryer includes counter-style top, "no-sag" organic finished tumbler, 15,000 btu per hour output, and two thermostats for complete control of chamber.

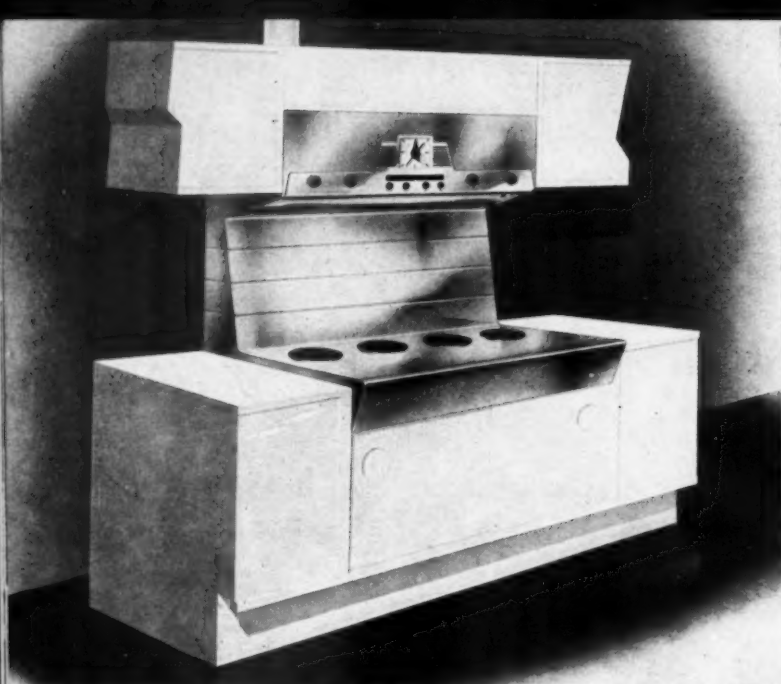


Remington's new low-and-narrow air conditioner provides for window installation without cutting out so much of the window light. Installed at either casement or double hung window at the bottom or top of the opening, the units project as little as 2½" from the window line, and fit onto 115 volt outlets with an input of 12 amperes.

Vornado's new automobile air conditioner has been designed to fit every car, allowing mass production techniques to bring lower cost and put units more onto the market. Ultra-modern styling, quick installation, automatic thermostat are some of the features. Unit can be easily changed to new car from old.



Kelvinator's new ranges feature high-fashion backguard and contemporary design. Backguard color of antique gold is hi-lighted by accents in black. Color theme continues throughout.



The

Accentuated

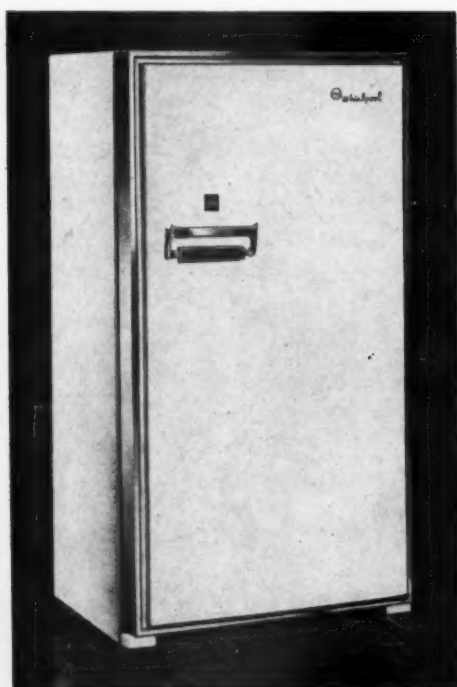
Perpendicular

simplicity of line, the increased use of stainless steel and aluminum for trim—increased anodizing on interiors spark interest in the new offerings

FOR 1957 there is a “new look” with the tight tangent bend accentuating the perpendicular lines of many of the new models being offered—models designed to blend into the setting, whether it be kitchen, basement, or living room. New excitement throughout the buyer’s market is sure to result from

this development in appliance design. The use of the squared corner was heralded earlier by Industrial Designer Brooks Stevens, whose drawings included that of an electronic range, using a similar design pattern. This is shown in the upper left hand corner—as it appeared in an earlier issue of *finish*. Stain-

less steel and aluminum—laquered and anodized—have been added to the organic finished and porcelain enameled surfaces as appliance manufacturers and their designers pushed up their models to sweep in a new era in appliance design to eliminate the “bulky” look of recent years.



Whirlpool entry into the full appliance line, with 14 major appliances, all make use of the “new look” in model design with the accentuated perpendicular.



Preway’s new model, a brand new item for them, is their built-in oven which is clean in line. It comes with either an antique copper finish or in stainless.

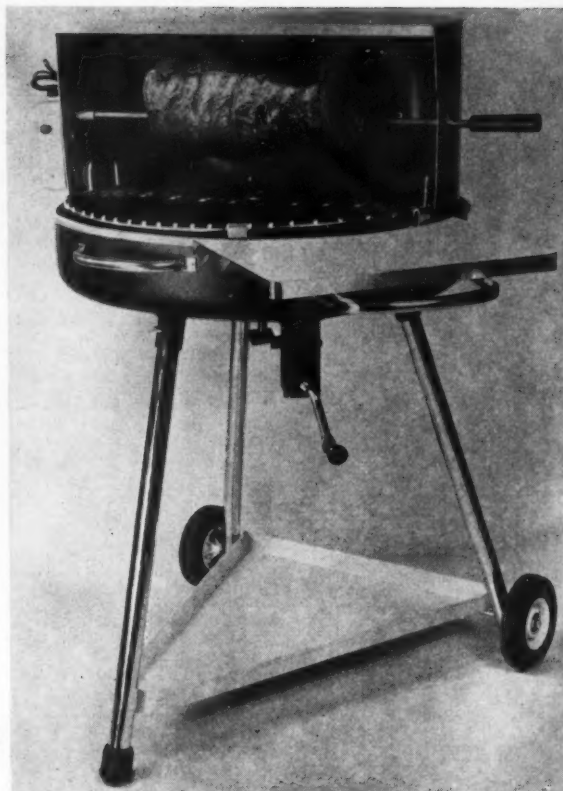


Frigidaire’s straight line simplicity is shown here in their automatic dishwasher. New design blends in well with squared off cabinets and woodwork.



► **Kuehne's** new Elsinor group accentuates the straight tapered new lines. It has black baked on enamel, electrostatically applied, with solid brass ferrules and trim. Chairs are in black, with gold overlay vinyl.

Union Steel has accentuated simplicity in their new line of barbecue units. This high-low model has a 24" 14 gage steel fire bowl $6\frac{1}{2}$ " deep; $1\frac{1}{4}$ " polished chrome legs and balloon tires.



Republic's new sink tops of stainless steel are also examples of the straight line. Photo show's Republic's 66-inch twin-bowl stainless top as it will appear on a roomy undersink cabinet.



Ironrite has built-in beauty in this ironer which uses the perpendicular line in accentuated simplicity to make a display piece of furniture out of its top line of easy-to-use ironers.

finish JANUARY • 1957



PERSONAL PORTABLE BY **Admiral**

Another product advancement made possible by
aluminum's unique combination of design advantages

LIGHTNESS . . . A 10" screen Admiral portable TV set with cabinet of Kaiser Aluminum weighs only 16½ pounds. Aluminum makes possible minimum weight for maximum portability.

STRENGTH AND DENT RESISTANCE . . . Designed in aluminum for the strength, rigidity and resistance to accidental damage required for a portable appliance.

FINISHABILITY . . . Aluminum lends itself perfectly

to all protective and decorative finishes, whether color-fast baked enamels (shown here) or permanent anodized colors. Also available in a variety of patterns.

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FAVORABLE MATERIAL COST . . . Aluminum assures Admiral an economical, high quality product satisfying all design and manufacturing requirements.



LIGHT WEIGHT BY *Kaiser Aluminum*

LET US HELP YOU take full advantage of all the design opportunities aluminum offers—a combination of useful properties that no other material can match—including thermal conductivity, electrical conductivity, heat and light reflectivity, corrosion resistance, non-toxicity, non-magnetic quality.

A Kaiser Aluminum design engineer will work with you upon request. Contact the Kaiser Aluminum sales office listed in your telephone directory.

Kaiser Aluminum & Chemical Sales, Inc., General Sales Office, Palmolive Bldg., Chicago 11, Illinois; Executive Office, Kaiser Bldg., Oakland 12, Calif.

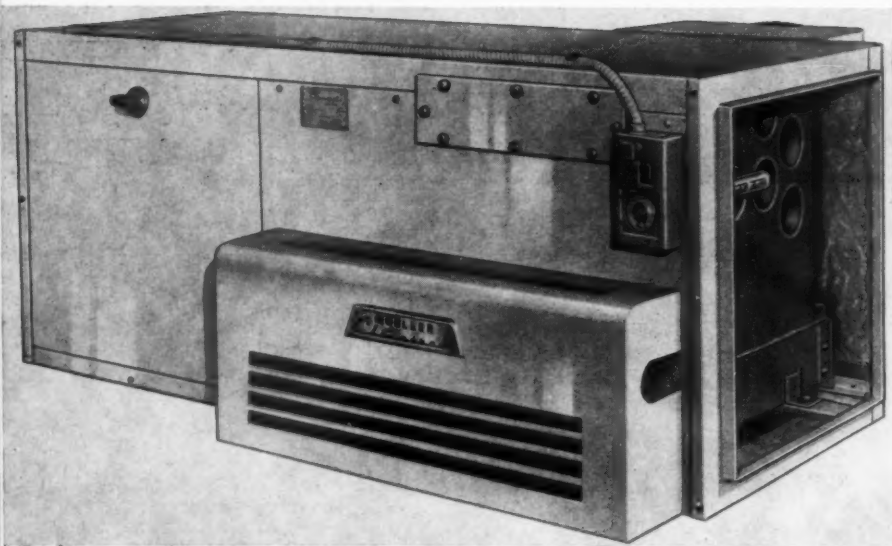
Kaiser Aluminum

See "THE KAISER ALUMINUM HOUR." Alternate Tuesdays, NBC Network. Consult your local TV listing.



Admiral PERSONAL PORTABLE TV—with rigid, lightweight cabinet of Kaiser Aluminum—is really designed to "take it" over a long life of hard knock-about service. 15 bright, modern colors . . . 3 sizes to choose from.

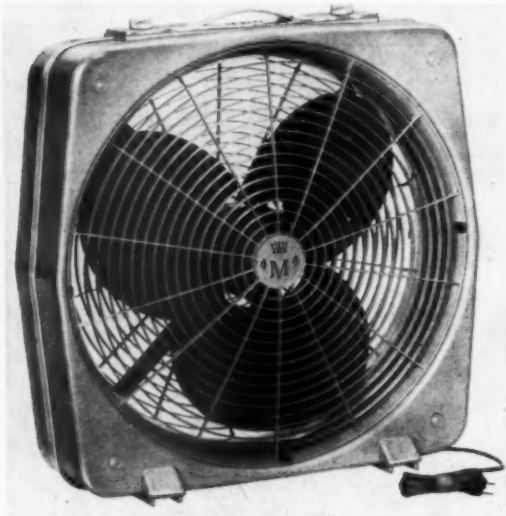
*ALL SCREEN SIZES DIAGONAL MEASUREMENT.



Mueller Climatrol has specially designed their horizontal forced air gas furnace for attic, crawl space or suspended installation. Shipped fully assembled, the unit offers much opportunity for new as well as remodeling jobs.

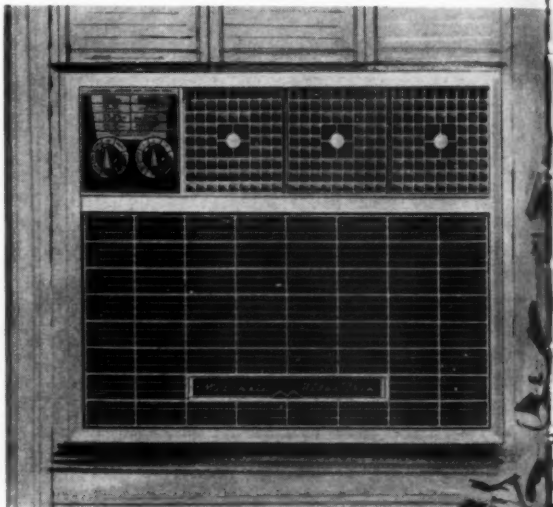


Lau Blower has a new mobile air circulator that can be rolled from room to room. Heart of unit is 16½" blade-diameter three speed fan, mounted on tube steel.



Meier's new model portable electric fan features an all-plastic case, and is said to incorporate engineering principles made possible only with use of plastic. Unit has been tested for high tensile strength and proven out.

Mitchell's "Ultra-thin" series occupies 54% less space than models of similar capacity. It operates on 115 volt current and has special "current saver" engineering incorporated into unit.



Sub-Zero Freezer is bringing out a complete new line of built-in refrigeration equipment consisting of seven models for large and small kitchens. Some models can be used as "stack-ons" or built into existing cabinets.



Hardwick's new gas ranges have been redesigned to fit into the smaller kitchen sizes. Units contain all virtues of much larger ranges with large oven.

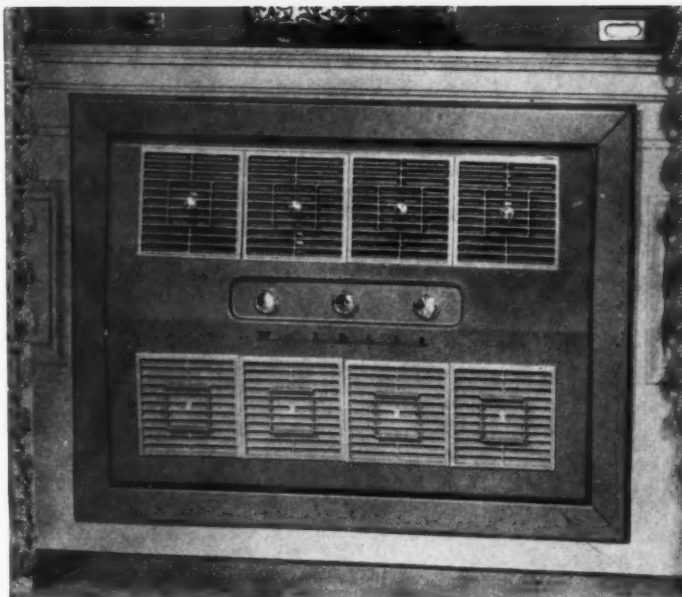


Vendo's new "million-dollar-cup-of-coffee" automatic vendor uses vacuum-packed tins of coffee and a new "infusion brewing" method. A million dollars in research went into its development. Unit will brew 900 cups with the 1/4 lb. vacuum tins of coffee serving as disposable brewing chambers within the machine. This provides ideal serving at the installation site.



RCA Whirlpool's new electronic range provides for micro-wave cooking, creating new wonders in the kitchen. Those six ears of corn cooked in 7 minutes. Conventional cookery would have required 21-minutes.

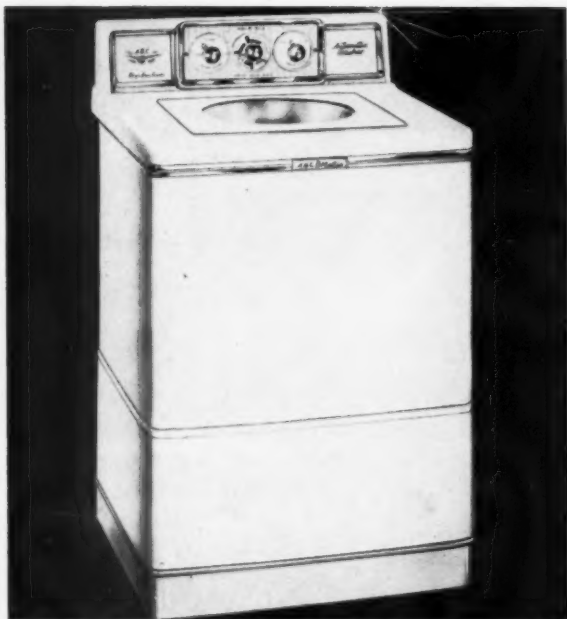
Welbilt's new air conditioner for under-window installation has been announced. Units are designed for in-wall installing so there's no inside or outside projection, for apartment house installations.



ordson has brought out a new model combination refrigerator-freezer consumer unit has baked enamel finish, uses cold wall construction. for commercial use, as well as a combination for the consumer market.

Norris-Thermador, and its subsidiary, A. J. Lindeman & Hoverson Co., will introduce two new models at the NAHB show in January. The new freezer-refrigerator is beautifully styled with roll-out shelves.





ABC Models for 1957 feature gold trim. Produced by the Altorfer Bros, this new washer has two speeds, three wash water temperatures and true overflow rinse action.



Fedder's new dehumidifier is just one of the new models being introduced this year. Thin and low design is feature of the line.



Bissell's new carpet sweeper carries further the theme of simplicity and beauty with the new chrome-plated special packaged model.

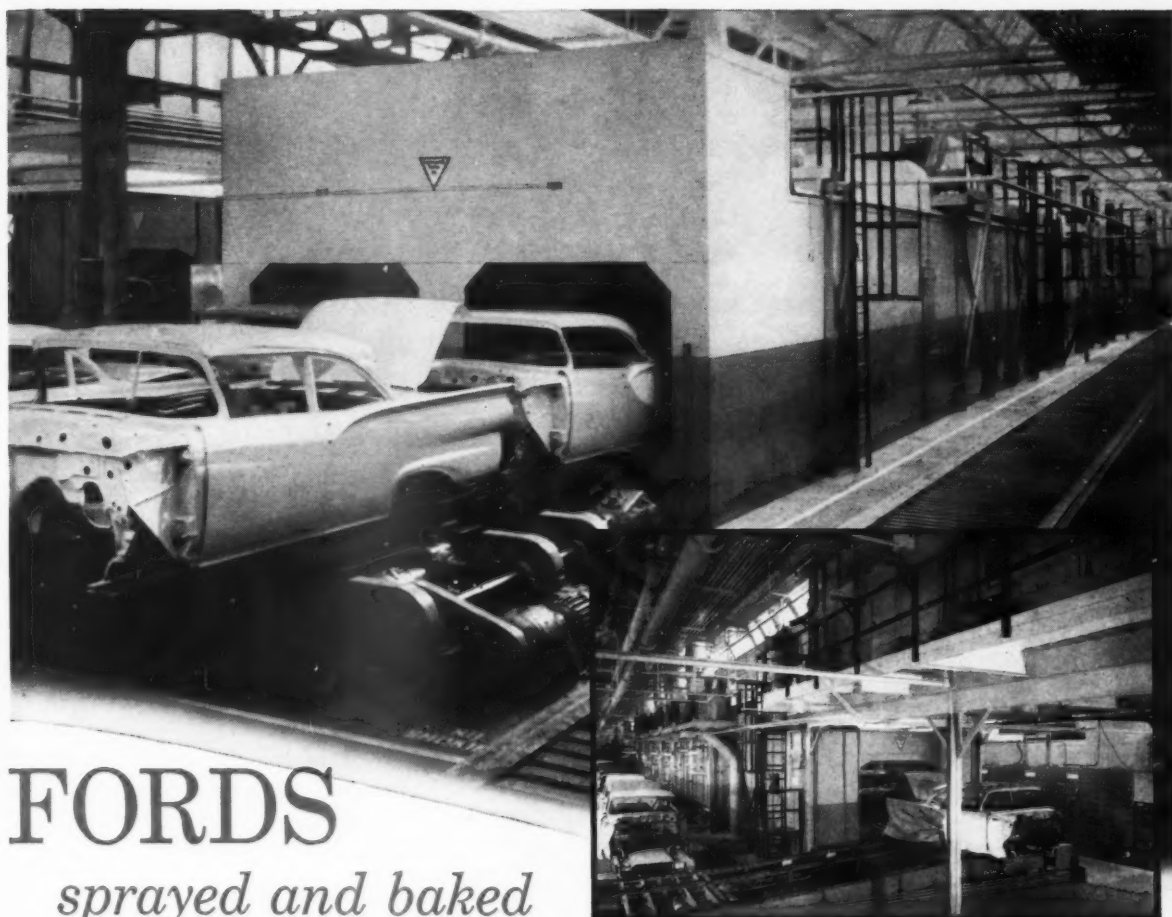
Lewyt's new power cleaners retain the big wheels of earlier models but has a new power dial that allows homemaker to set required suction just as she would set a steam iron.



Lawson's new line of aluminum water heaters, adding to their galvanized and stone and glass lined models. Units are two tone styled and have glass fiber insulation.



Florence Stove's new automatic vending machine, the "Shake-A Mat", features constant refrigeration at door, patented whipping valve to make up thick milk shakes.



FORDS

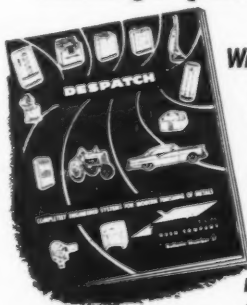
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Twin Cities Assembly Plant*

This new DESPATCH finishing system enables Ford Motorists to get the colors they want . . . solids or 2 tones . . . and get them *on schedule*. Smaller photo above shows body shells entering block long down draft spray booth. Large photo shows finished units emerging from twin baking ovens.
You should see this in color!



Write today for Bulletin 51

16 colorful pages of suggestions, tips and ideas on modern ways to achieve better finishes, faster production and smoother handling of metal products . . . at lower cost.

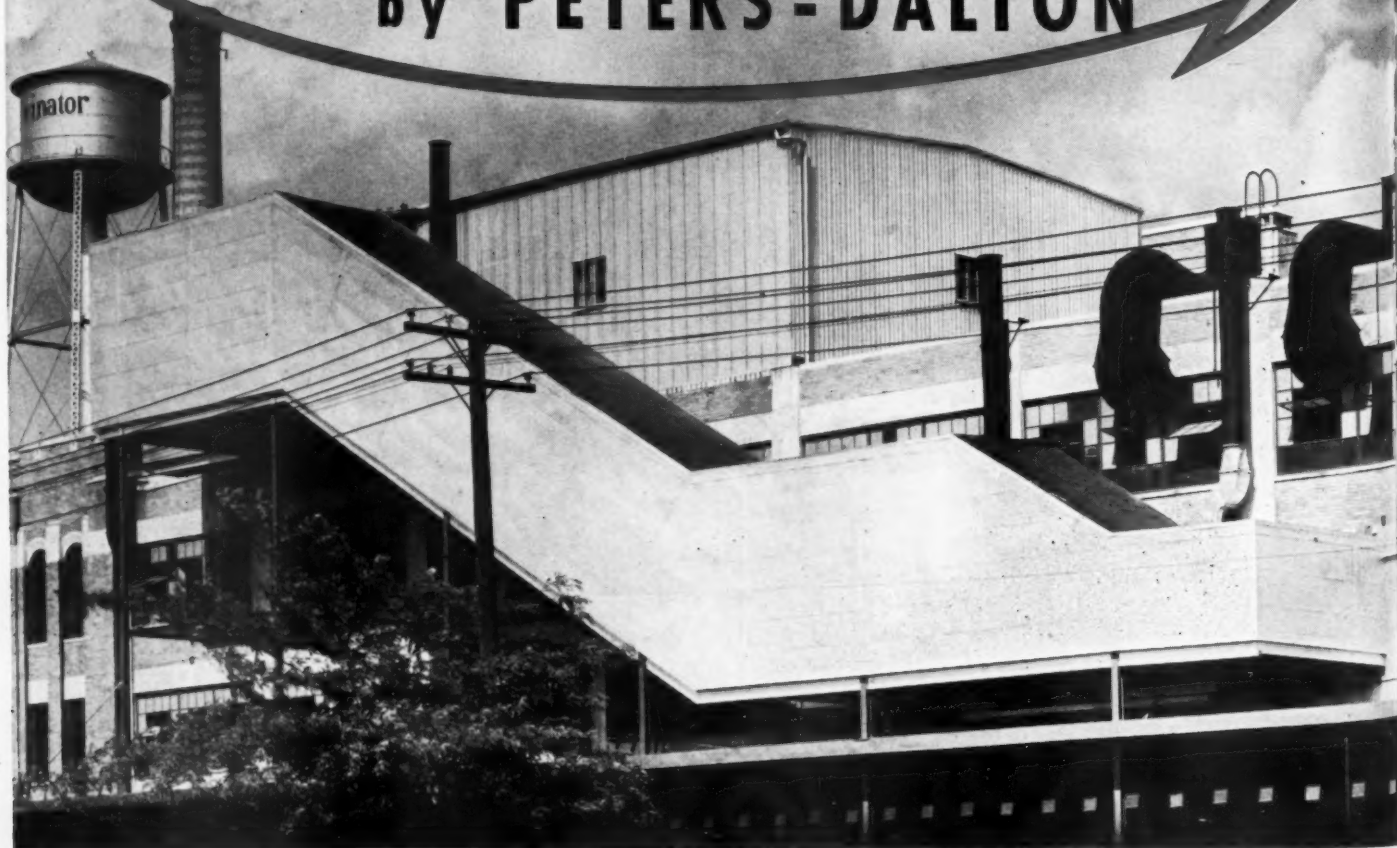
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PLUS for PLANT CAPACITY— **ROOF OVENS** by **PETERS-DALTON**



The above photo illustrates part of a Peters-Dalton installation in the plant of a major appliance manufacturer. Here, as in most plants, manufacturing floor space was at a premium. Literally adding many hundreds of square feet to plant capacity, dehydration ovens were built on the outside, through which assembled compressors are conveyed roof-high and returned to final assembly stations. The large enclosure on the roof-top houses heating equipment. Working in conjunction with plant officials, P-D engineers installed the ovens as shown — thus eliminating the waste of much valuable plant space that otherwise would have been used for the conveying of parts to and through the ovens.

Whatever your finishing needs . . . whether for power spray washers, paint spray booths, air make-up systems, dust collection systems, or ovens of all types . . . call, with confidence, upon the more than quarter century of experience enjoyed by Peters-Dalton in designing, engineering and building this equipment for American industry. Regardless of the size of your requirements . . . from single units to multiple or large systems or continuous operations . . . your production needs can be met with complete satisfaction and assure years of dependable service. Just write, wire or phone — we'll be glad to tell you more.

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Interest in low temperature porcelain enameling draws capacity crowd to 18th shop practice forum

**speakers stress need for critical control of cleaning operations in
aluminum preparation—discuss electrostatic application of colors**

by Charles R. Sample • MANAGING EDITOR

A paper by Paul Kates, Ferro Corp., on "Porcelain Enamel on Aluminum Foil" was presented by M. L. Simmons.

Simmons reported on Ferro's work in developing a pilot plant for porcelain enameling aluminum foil and the results that they have achieved. Data on the equipment, and the process, was presented by Simmons.

Concluding the "aluminum" session, du Pont's B. C. Bricker, gave a comprehensive study on "architectural applications" of porcelain enameled aluminum panels. Pointing to the potential of the future by discussing the accomplishments of past results, Bricker answered the question of "How long will it last in service?" by pointing to installations which have withstood more than 10 years of outdoor exposure without showing any indication of failure or even deterioration. Bricker also pointed out that it has been demonstrated that porcelain enameled aluminum can be fabricated on the job and that there are savings to be had in its handling and installation as compared with other materials.

Architectural porcelain enamel

Bricker pointed out that today's architect, designer, and engineer has been provided with a completely new structural and decorative medium. The ease with which aluminum can be extruded, shaped and roll coated opened unlimited functional design possibilities. Listing outstanding examples of porcelain enameled aluminum in architecture, and exemplifying the potential by pointing out that the new Hampton Roads vehicular tunnel in Virginia will have a porcelain enameled extruded aluminum ceiling—Bricker then went on to point out that the 17 porcelain enamelers working with aluminum, 10 had no

previous experience with porcelain, and 11 had no previous experience with aluminum, and 6 had no previous experience with either.

Stresses need for proper cleaning

Bricker went to some length to emphasize the need for strictness in thorough cleaning procedures, stressing that improper cleaning of the base metal is the cause of most trouble in porcelain enameling of aluminum.

"A typical cleaning procedure today," he said, "consists of two bath treatments, each followed by a water rinse. Pre-firing is gradually being eliminated. Generally, the ground coating is omitted. We have proved that bond can be obtained with a pigmented enamel and that the cover coating can be sprayed directly onto the base metal. Conclud-

ing, Bricker pointed out that with teamwork by suppliers, fabricators, and enamelers, the full impact of this new market will be realized.

Nickel deposition given study

Ingram-Richardson's Clark Hutchison presided over Thursday's concluding session, which dealt with metal preparation. Chicago Vit's J. M. Zander spoke on "Nickel Deposition in Automatic Spray Pickling," pointed out that this method has proven to be the solution to the problem of providing the pickling capacity necessary to meet the ever increasing demand for higher rates of production.

Pointing out that this method is by no means as trouble free as immersion pickling, Zander emphasized that the conditions under which metal prepara-



SYMPOSIUM OF LOW TEMPERATURE ENAMELING speakers were J. B. Willis of Pemco, E. E. Howe of Chicago Vitreous, J. H. Giles, Jr., of the O. Hommel Co., R. F. Rush of Ferro Corp., Rush S. Dale of Ervite Corp.; George Tuttle of Benjamin Electric Mfg. Co., and Harlan Tripp of General Electric.

tion suitable for porcelain enameling can be obtained by spray pickling are far more critical than for immersion pickling. He then went on to explain the full procedures, and suggested practices, for proper spray pickling.

Philco's John Finley, Jr., spoke on nickel deposition, telling of his company's nine stage, continuous spray wash automatic pickle machine. A detailed explanation of the operation as handled by his company was presented. He pointed out that Philco has obtained very satisfactory results by using sodium hypophosphite as a means of increasing nickel deposition in their spray pickling operation.

Pickling accelerators and inhibitors

A survey on the use of Pickling accelerators and inhibitors was then presented by Pemco's Henry A. Spiers, who reported on the results of a study made by his company. Maytag's R. C. Thompson concluded the "Metal Preparation" session with a report on the modernization of the cleaning system which has been accomplished at his company. Details on the shot blasting, and burn-off procedures, as he explained them, are given in detail in the August, 1956, issue of *finish*, in the porcelain enameling section of "The Maytag Story."

Thursday's concluding session was on "Milling" with Pemco's Robert Patrick, speaking on "Mill Additions in

Titania Opacified Enamels." A clearly detailed summary on the effect of such additions was presented in printed form and supplied every attending member.

H. F. Russell, of the Borg-Warner Ingersoll Products Division spoke on the "Vibratory Method of Screening". Russell told of the developments made by his company during the past two years, since they began studies on ceramic coating systems which required fine grinding on the order of 1 to 3% on a 325 mesh screen.

Enamel application is studied

Thursday night was the official banquet and Friday morning the final sessions concluded the meeting. Whirlpool-Seeger's Paul Thompson presided over the first section which was on "Enamel Application and Firing." First speaker was Ransburg's Emery Miller who gave a clear detailed explanation of the theory behind Electrostatic Spraying, and showed with detailed drawings, a typical installation. Ing-Rich's Martin DuBovy was second speaker, enlarging on the Miller report by discussing his company's results with electrostatic spraying of porcelain enamel in color. Pointing out the differences between hand and electrostatic spraying, and the conditions which Ing-Rich arrived at in their operation, DuBovy noted that about 20% of his company's production is now being run with the same efficiency in color as with white.

GENERAL INTEREST SYMPOSIUM speakers included R. J. Baker, chairman, Frigidaire Division of General Motors; Mrs. Francis Nelson, Illinois Water Treatment Co.; James K. Magor of U. S. Steel; Paul Thompson of Whirlpool-Seeger; and J. C. Richmond of the National Bureau of Standards. **ENAMEL APPLICATION AND FIRING** section speakers were Paul Thompson, chairman, Whirlpool-Seeger; Emery P. Miller, Ransburg Electro-Coating Corp.; M. P. DuBovy, Ingram-Richardson, Inc.; William R. Brooks, Binks Mfg. Co.; and William J. Price, The Maytag Co.



Match between parts has been good, he pointed out, and rework is accomplished easily by giving the parts a half coat of the cover coat. The electrostatic enamel is applied at 22 to 24 grams per square foot for the first coat, and about 12 grams for resprays. One coat ware has consistently run at 90 percent," he reported, "and there have been runs as high as 95% in some cases."

Automatic dipping at Maytag

A clear explanation in the development of equipment to keep pace with developments within the industry was given by Bink's William R. Brooks, speaking for B. J. Hedger, on the topic "Hand Spraying with Automatic Spraying."

Brooks pointed out the advantages of automatic spraying, but also pointed out the need for careful control of spraying procedures, and the adequate adaptation of methods to fit plant conditions.

Maytag's Bill Price, speaking for W. A. Irvine, was next on the program, reporting on the automatic dipping and flow coating operation at the Maytag No. 2 plant. Details on this operation, which he discussed thoroughly, were included in the August 1956 issue of *finish* in the report on the Maytag operations.

Cites convection firing advantages

Convection firing was then discussed with R. F. Rush of Ferro citing the conditions and problems in firing low temperature porcelain enamels, and the advantages resulting from the use of convection in firing.

Although forced convection heating in enameling furnaces was developed primarily for firing low temperature frits, Rush pointed out that its application to furnaces operating at conventional temperatures improves the firing cycle and promotes ware temperature uniformity. "The direct results of the temperature uniformity," he noted, "are less warpage, less hair lining, and improved color control."

Concluding papers of the symposium were presented in a General Interest forum with Frigidaire's R. J. Baker presiding. "De-ionized de-gased Water" was given a thorough analysis by Mrs. Francis Nelson, speaking for W. S. Morrison of the Illinois Water Treatment Company. Following her report, James K. Magor of U. S. Steel Corp. reported on "Hydrogen Defects" and Whirlpool-Seeger's Paul Thompson spoke on "Piping Systems". Final speaker of the forum was J. C. Richmond, of the National Bureau of Standards who spoke on the "Mechanical Properties of Porcelain Enamel."

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LESSON IN GOOD PROGRAMMING

Top speakers, topics spark December meeting of Midwest Enamellers

THE program for the Midwest Enamellers Club meeting held December 1 was acclaimed by many in attendance as the best that has been offered to the club membership.

In announcing the program, the committee, in its advance literature, said "This is it!" and announced the general subject for the meeting as "Advantages and disadvantages of lowering your firing temperature."

An important group of technical men and practical plant operators formed a panel of speakers for the meeting which followed luncheon at the LaSalle Hotel, Chicago. Among the speakers were W. H. Pfeiffer, material & process engineer, Frigidaire Division, General Motors; Dr. J. J. Canfield, supervising metallurgist, Research Laboratories, Armco Steel Corp.; J. M. Zander, chief chemist, Chicago Vitreous Corp.; George Tuttle, ceramic engineer, Benjamin Electric Co.; H. F. Russell, ceramic engineer, Ingersoll Products Division, Borg-Warner Corp.; Paul Gruber, asst. chief engineer, Ferro Corp.; and Dr. A. L. Friedberg, Research Assoc. Professor, Ceramic Engineering Dept., University of Illinois.

Subjects covered by the individual speakers in brief presentations to encourage discussion were: "Fields of Application" (for lower firing temperatures) by Mr. Pfeiffer; "Steel" by Dr. Canfield; "Pickling and Metal Finishing" by Mr. Zander; "Millroom Practices" by George Tuttle; "Application, Drying and Firing" prepared by Mr. Russell and Glenn Lynn; "Furnace Construction" by Mr. Gruber; and "Properties of Fired Coatings" by Dr. Friedberg.

In discussing fields of application, Mr. Pfeiffer listed the following four possible advantages that can result from reduced firing temperature:

1. The use of thinner steel sheets and lower cost grades of steel.
2. The use of a single grade of steel for parts which are finished with porcelain enamel in some cases or with paint or electroplate in other cases.

3. Ability to simplify designs or to enamel larger or more complicated parts.

4. Better fit of the enameled parts in the assembled product.

The speaker offered a word of caution by pointing to the adjustment of enamel frit composition necessary to gain lower temperatures and the resulting progressive loss in resistance to chemical attack and a tendency for reduction in compressive strength (lower compressive strength enamels have less resistance to cracking and to thermal shock and may be more subject to hairlining). Mr. Pfeiffer cautioned that the lower temperature enamels have not been of advantage for products where the gauge of the metal is dictated by the end-use rather than by the enameling need, and where special properties are most needed. These products include hot water tanks where resistance to attack by hot water under pressure is of paramount importance. They also include bathtubs, sinks and lavatories where smooth surface, resistance to abrasion and resistance to hairlining are paramount. Enamels for these uses are fired at temperatures around 1550° F.

The firing temperatures of enamels for the exterior parts of ranges (except top surface parts), washers, dryers and refrigerators and for refrigerator linings have been reduced to about 1500° in most cases, and perhaps as low as 1450°

in some cases, Mr. Pfeiffer reported. Lower temperatures, he said, have made possible the enameling of large parts of welded assemblies and in some cases parts made of a non-premium grade of steel or thinner gauge steel. At the same time, the distortion of parts has been reduced, and better fit of the parts in the final assembly has resulted. A temperature of 1350° F. or lower would probably be necessary to obtain the fullest advantage for these parts. The speaker outlined other limiting factors in the use of so-called "low temperature" enamels and presented the advantages and disadvantages to be expected.

In referring to enamels fired at temperatures in the 1300° range, Mr. Pfeiffer said, "At present these enamels are being fired in the neighborhood of 1350° F. on such products as chalk boards and light reflectors and perhaps on some panels for shower stalls, telephone booths and for general architectural purposes." In continuing he said, "The enamel materials for the 1300° F. temperature range are of premium price but this cost is offset by the low weight of the steel and the use of non-premium steel. The colors, surface textures and enamel properties required for these parts seem to be attainable."

Sagging versus warping

In covering the subject of steel and enameling iron for low temperature enameling, Dr. Canfield said, "Many consider that sagging of the metal will be eliminated and that commercially pure iron would be replaced by low carbon steels when firing temperatures are lowered below 1400° F. Sagging of the metal with either enameling iron or low carbon steel is much less at 1400° F. than at 1500° F. Some sagging does occur even at 1400° F. when supports are too far apart or the metal is too

to Page 62 →



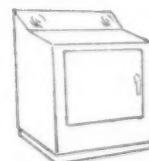
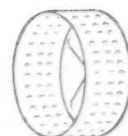
SPEAKERS included A. J. Holloway, club president, Lawndale Enameling; George Tuttle, Benjamin Electric; W. H. Pfeiffer, Frigidaire Division of GM; and Ferro's Paul Gruber.

It's time to take a new look at porcelain enameling!

FOR LAUNDRY EQUIPMENT, FOR INSTANCE:

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In many new facilities for porcelain enameling, *automation* devices save time and money while electronic controls assure the highest standard of quality and uniformity in the finished products.

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below. Into them has gone the know-how and experience of 35 years of industry leadership, during which time Ferro has built nearly 90% of all modern porcelain enameling facilities.

There is no question but that porcelain enamel is coming into ever wider and more extensive use. Naturally, the most efficient facilities will be the most profitable. Can we help *you* get a bigger, more profitable share of this rapidly expanding business?



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Engineering Division

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MIDWEST CONTINUED

light in gauge. Even as low as 1400° F., the sagging of commercially pure enameling iron is less than with the low carbon steels. When sagging of the metal does occur in a horizontal area through lack of sufficient support, a warping or twisting of the entire panel can result. Just how important this difference may be in production runs is yet to be proved."

In referring to the confusion that many times exists between the terms warping and sagging, Dr. Canfield said, "Warping or twisting usually occurs from things other than sagging such as from unequal rate of heating of various areas of the ware and from relief of unequal stresses introduced in forming. The use of lower firing temperatures will not relieve the need for the present precautions to control warping. It is expected that warping will be as much a problem at the lower firing temperature as at the higher firing temperature."

Millroom practices

In discussing millroom practices for low temperature enamels in the 1250° to 1350° F. range, George Tuttle said that, in general, milling time is five to ten per cent less than when grinding to the same fineness for conventional enamels (using the same ball charge and the same grinding media).

"Based on our experience," said Mr. Tuttle, "the major difference in the control of low temperature enamels is in the handling and setting-up phase of the control operations." He hastened to add that the low temperature enamels with which they are working are special purpose enamels designed to answer definite end-use specifications.

The millroom procedure for ground coats is as follows: grind to fineness of 5-6 grams on 200 mesh screen; screen through 60 mesh screen; spray at specific gravity of 1.78 for 2½ mil application; pick-up—35 to 40 grams on 1 square foot cylinder; water content—approximately 35%.

The millroom procedure for titanium cover coats is as follows: grind to fineness of ½ to 1 gram on 200 mesh screen; screen through 60 mesh screen; spray at specific gravity of 1.71-1.72; pick-up—80 to 90 grams on 1 square foot cylinder; water content—approximately 32%; add 5 to 6 ounces urea/100# to control tearing.

Standard millroom procedure for chalkboard enamels is as follows: grind to fineness of ½ to 1 gram on 325 mesh screen; screen through 80 mesh screen; spray at specific gravity of 1.81-1.83; application weight—2½ to 3 mils;



OTHERS ON PROGRAM were Dr. A. L. Friedberg, University of Illinois; H. F. Russel, Ingersoll Products; Dr. J. J. Canfield, Armco; and Arthur Lander, Lawndale Enameling.

pick-up—20 to 24 grams on 1 square foot cylinder; water content—34 to 35%; add 3 to 4 ounces urea/100# to control tearing.

In referring to aging, Mr. Tuttle said that while it is not general practice to age enamels beyond two weeks, it is occasionally unavoidable and there is some evidence that the solubility of some of the low temperature enamels is such that they are more susceptible to scumming. "However," he said, "this can be controlled by the addition of barium chloride at the mill."

This speaker concluded by stating that, generally, millroom practices for low temperature enamels are essentially the same for most applications, and on certain special applications the working control limits are narrowed because of the lighter spray weights and rigid finish specifications.

Spraying, drying and firing

In referring to application equipment and methods, Mr. Russell stated that his reference to "low temperature" enamels was in the 1300° F. range, and "conventional" enamels in the 1500° F. range.

A smaller fluid tip for guns is required and air caps to give maximum atomization. Slightly lower atomizing pressures with the gun closer to the ware are recommended. Fluid nozzles and air caps should be used to satisfactorily handle up to 800 cc of fluid per minute. The coatings must be sprayed wet and should preferably "wet out" on the first pass in spraying.

In discussing drying, Mr. Russell referred to the "considerably thinner" coating thickness for many low temperature applications. This means less volume of water to be removed. "These factors," he said, "are a function of the application, however, and occur not because it is a low temperature coating. The same would be true if we applied

conventional enamels at these film thicknesses."

Mr. Russell cautioned his audience that while lower maturing temperatures can be achieved, a longer firing cycle should normally be expected. He did state, however, that within the last few months his company has found that better results were obtainable at faster chain speeds than those originally used. "In fact," he said, "we are now using faster chain speeds than on our conventional enamels for comparative gauges."

Furnace construction

In discussing furnace construction, Mr. Gruber divided his information into four categories: construction of furnaces for use at over 1500° F.; construction of furnaces for use at 1450° F.; construction of furnaces for use at 1350° F.; and construction of furnaces to be used under 1300° F.

"For practical furnace design and operation," he said, "we recommend radiation for temperatures above 1300° F. and forced convection, or a combination of radiation and forced convection for enameling temperatures below 1300° F. The theory behind this rule is that radiant heat up to 1000° F. is, on an average, 30% effective as it is at 1600° F. Forced convection heat at an operating temperature of 200° F. accounts for 50% of the total heat transfer, at 600°—25% and at 1000° F.—17%."

According to this speaker, enamels in the 1000 to 1300° F. range make forced convection furnace design a "must" (see article titled "A new era for Enameling Furnaces" by Elmer W. Dany, September 1956, issue of finish).

Only the highlights of these important papers could be covered in this news report. Only those reports are quoted for which finish editors had original manuscripts for checking data. For those enamellers working with low temperatures, the editors suggest procurement of the complete manuscripts from the authors. All are brief and to the point.

IF...

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1300°

1400°

1500°

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- protecting

ALUMINUM	<p>DESCALING: Complete line of deoxidizing and polishing products for all alloys of aluminum.</p> <p>COATING: Economical and "quick fixing" conversion coating for application by spray, dip or hand methods. Approved to MIL-C-5541. Insures paint adhesion, stops aluminum corrosion.</p> <p>PROTECTION: Alkali-removable protective film for aluminum alloys both during storage (in plant and outdoor) and during fabricating practices.</p>
STEEL	<p>DESCALING: Complete line of alkaline and acid descaling media.</p> <p>COATING: Full line of iron, zinc and manganese phosphate compounds to provide a tight coating for better adhesion of organic finishes and for oil absorption. These materials all meet the various requirements of applicable government specifications.</p> <p>PROTECTION: Versatile group of products for protection of parts from the elements.</p>
TITANIUM	<p>DESCALING: Approved and accepted process for conditioning and removing scale from all current titanium alloys, both after heat forming to 1150° F. and heat treating to 1750° F.</p> <p>COATING: Acceptable anti-galling and seizing conversion coating for the major alloys of titanium. Also used as base for lubes. Requires no post-heat treatments.</p> <p>PROTECTION: Easily removable coating to protect titanium against tightly adhering scale up to 1600° F. during hot forming or heat treating.</p>
STAINLESS STEEL	<p>DESCALING: Process for completely removing heat scale from various alloys (including 17-7 PH).</p> <p>COATING: Easily removable coating to protect stainless steel against tightly adhering scale up to 1600° F. during hot forming or heat treating.</p>
MAGNESIUM	<p>DESCALING: Non-electrolytic alkaline process for removing previous chrome pickle films as well as oily substances often found on magnesium.</p> <p>COATING: One-package powdered product which, when in solution with water, replaces Dow #17 treatment. Requires no mixing of chemicals. Eliminates chance of human error.</p> <p>PROTECTION: Single-package touch-up liquid to produce coatings equal to Dow #18 treatment.</p> <p>(Note: All magnesium processes mentioned above are approved for use by Magnesium Department, Dow Chemical Co.)</p>

If your requirements call for chemical processing of metal, chances are you'll find your best solution in the complete Turco line. Charted here are a few of the chemical processes Turco manufactures for the metal-working industry. There are many other types of Turco processes that perform effectively on any known metal. Why not use the coupon below to write for free literature on the metal you are processing? There is no cost... no obligation.



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IAM management meet held in Washington

year-end meeting theme is review of progress during 1956, a study of present market situations, and the potential for '57 and the long pull

by Dana Chase • EDITOR AND PUBLISHER

THE 1956 Year-End Management Conference of the Institute of Appliance Manufacturers was held in the resort atmosphere of the Shoreham Hotel, Washington, D.C., on December 3, 4, and 5.

The theme of the meeting was a review of progress during 1956 and discussion of the present market situation with a strong focus of attention on the potential in 1957 and over the long pull. Included in the discussions were the subjects of public relations with employees, customers and investors; such subjects as color simplification and excise taxes; the study of government departments that affect the major appliance industry; and individual meetings for the various separate appliance divisions.

There was a noticeable increase in the number of ladies attending this year's meeting which may have been the combined result of the encouragement of this trend by IAM officials and the choice of the nation's capitol as a meeting place.

A dynamic appliance market

The first speaker on Monday morning's keynote session was Leonard Raulston, president of the Institute, and vice president and general manager, United States Stove Co., South Pittsburgh, Tenn. Following his review of Institute activity, Vergil D. Reed, vice president, J. Walter Thompson Advertising Agency, New York City, was introduced to present his story on "Building a Dynamic Appliance Market". Early in his talk

he said; "The only limitation in your opportunities since 1949 has been your ability to make the most of them." He used a few pertinent comparisons to illustrate this point:

In June 1949, our civilian employment was 59,619,000. In June of this year it was 66,503,000, an increase of almost 12 per cent. By 1965, it should reach 73,000,000.

In 1949, our gross national product (all goods and services produced) was \$257.3 billion dollars. Today (1956) it's running at an annual rate of \$413.8 billion, an increase of \$156.5 billion or over 60 per cent. By 1965, it should reach 535 billion dollars (in 1953 constant dollars)...

Personal consumption expenditures in 1949 were \$180.6 billion. Today (1956) they are running at an annual rate of \$266.8 billion, an increase of al-

most 48 per cent. By 1965, they should reach at least \$357 billion (in 1953 dollars).

Total disposable personal income (income after taxes) was \$191.2 billion in 1949. For the third quarter of 1956 it was at an annual rate of \$288.2 billion, an increase of over 50 per cent. By 1965 it should exceed \$380 billion.

Reed raised this question: "Has your company's growth even kept pace, and is it keeping pace, with this virile and expanding economy?" He presented many other pertinent statistics affecting the nation's economy and the appliance industry specifically, and then he referred to "discretionary purchasing power of the consumer", meaning what the consumer has left after paying for taxes, housing, food and clothing. He pointed to the fact that this discretionary purchasing power alone is greater in this country than the total income of the consumer in some foreign countries he has studied.

"In most other countries," he said, "the market is assumed to be a static one and each competitor tries only to get a bigger piece of that fixed market ... In a static economy, one interest can gain only by taking something away from others. In a dynamic economy (such as ours) there is an increasing productivity to share among all interests — producer and consumer, capital and labor." In another reference to our economy, he said, "The satisfaction of needs is no longer imposed upon us as our objective. This is the age of wants,



J. H. Makemson of Roper Corporation presides at Kitchen Equipment Session.

IAM CONFERENCE CONTINUED

and wants are insatiable . . .

The effect of population change alone is important, as Reed indicated in saying, "If we total up the plus and minus scores of the Stork, the Grim Reaper, Immigration and Emigration, we find our population increasing by about 2,900,000 a year. That's adding the equivalent of a new city of 60,400 in each and every one of our 48 states each year. . . ." "We passed the 169,000,000 mark in November 1956. Between now and 1965 there will be a Thailand or Canada, plus a Denmark, added. In 1965 there will be 190,000,000 of us. Those are the increases to which you must grow to even keep up with the market." He cautioned, however, that these increases are by no means equally distributed geographically.

Households are your market

In discussing the actual market for home appliances, Reed said, "Today there are approximately 49,300,000 households making up your market. Between now and 1960 the number is expected to increase at an average annual rate of 778,000 according to Census Bureau projections—projections which I believe are still too low, even after recent upward revisions. According to those projections (Series I) there will be 51,838,000 households by 1960, with 56,145,000 by 1965 and 61,378,000 by 1970. New households, most of them in the suburbs and smaller cities, will bring increased demand for practically all consumer goods, and certainly for household appliances of all kinds. Beginning with the 60's the increases should be a market gold mine for you, with the marriages and new homes of that 'war baby crop'."

In referring to all of the increases in the dynamic future market, Reed voiced the realization that 80 per cent of the present appliance volume goes into



View at general luncheon in the Shoreham's Palladium Room.

replacements and home modernization. "That business will continue to be your bread," he said, "but think of the cake that growth can give you and the thick icing increased purchasing power can add!"

"We need not belabor the question of purchasing power. It's there and growing lustily. Our disposable personal income (income after Federal taxes) should reach \$7,000 per household by 1965 (in 1953 constant dollars). There are six-and-a-half times as many spending units* (roughly families) with incomes over \$3,000 as in 1941, and the climb up the income ladder is still a rapid one.

After picturing the future market for appliances in much greater detail than can be reported here, Reed made reference to a "10-Year Major Appli-

ance Forecast" and the "Gas Appliance Sales Between 1956 and 1975 Forecast". He then made this personal observation to the appliance manufacturers, "I am going to be disappointed in your initiative if there are not more than 5,218,000 washer-dryers, 11,275,000 dishwashers and 13,637,000 electric water heaters in use in 1966. What's more, these projections cannot include, of course, the many new products to which your industry should give birth in the coming years. Neither do they include the future opportunities in foreign markets."

Planning for profit

Another speaker during the keynote session was William B. Creech, manager of Major Accounts, Electric Appliance Divisions, Westinghouse Electric corp., Mansfield, Ohio.

Said Creech, "The area of marketing offers the greatest opportunity for 'planning for profit.' We have production and automation beyond our current capacity to market.

"Concentrate on the 'fears', he said, and you can talk yourself into a 'panic'—concentrate on the statistical facts and the projected potential and the reverse is true." Creech made reference to the unhealthy pricing situation and stated that in his opinion some major appliances (improved products) are selling for less than pre-war prices. To be specific, he said a 9 cubic foot refriger-

Climbing the Income Ladder

Disposable Income (After Federal Taxes)	Number Spending Units by Income Class (in millions)		
	1950	1956	1960
Over \$7,500	2.1	5.1	6.6
\$5,000 to \$7,500	4.3	9.5	16.2
\$4,000 to \$5,000	5.8	11.2	13.2
\$3,000 to \$4,000	9.5	10.6	12.0
\$2,000 to \$3,000	12.2	7.8	6.0
\$1,000 to \$2,000	11.1	7.3	3.6
Under \$1000	8.0	4.5	2.4

*Spending unit includes all persons living in the same dwelling and related by blood, marriage, or adoption who pool their incomes to meet major expenses. Single person spending units are included.



erator could be purchased for less than an 8 cubic foot in 1939, without adjustment for dollar value.

"One difficulty," he said, "is that an appliance distribution system of the 20s and 30s has been asked to handle the mushroomed appliances' full-line business." Creech believes that the "giants" affect the single-line manufacturers to no great degree due to the fact that most smaller producers sell direct to the dealers. "A full-line manufacturer," he said, "cannot be directly competitive with the short-line manufacturer." "Then, too," he added, "a manufacturer can't be *both* a short-line and a full-line manufacturer." "The full line," he continued, "is no guarantee of success. It's risky and expensive. For example, a few years ago six to eight hundred thousand dollars might be required for a new refrigerator line. Today this may reach three and a half to ten million dollars."

Referring again to the full-line as against the single-line manufacturer, the speaker suggested that once the manufacturers, distributors and dealers make up their minds, a pattern of distribution

will form. He feels that there can be two kinds of healthy and prosperous manufacturers as a result.

In discussing developments for 1957, Creech said:

"1957 will disclose a greater clarity to the power of multiple-line giants.

"1957 may see the return to sound planning and pricing practices.

"We want to be proud of what we make," he said, "and make money doing it.

"Sound policies must start at the manufacturing level.

Motivation by design

At a marketing conference on Monday afternoon, December 3, Gordon J. Lippincott of the firm of Lippincott & Margulies, Inc., Industrial Designers, New York City, spoke on the subject of "Motivating Customers by Design." In his opinion, more and more of the written word is not believed because there is too much "colossal-best-magnificent, etc." in written copy. "We can't rely on words alone," he said, "the 'look' is increasingly important for the product and for everything surrounding it from

the calling card and the label to company trucks."

Lippincott pointed to the appliance industry as a good example of "me too" products which, when displayed together on a sales floor, offer a confusing problem to the purchaser.

"Style, price and engineering must be right," he said, "but that is not enough. Eighty per cent of seeing is from memory of something seen before, the recall of experience. Therefore, the 'look' is increasingly important from product to label."

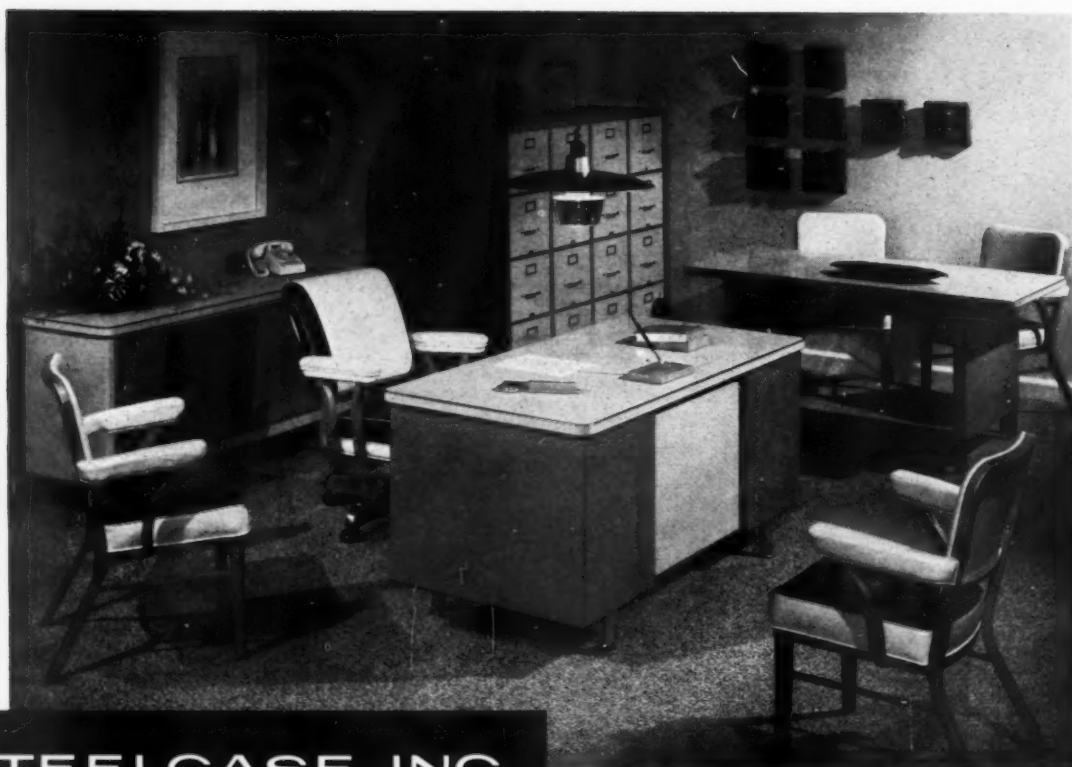
To get the approved corporate look calls for policy decisions. First of all, the "kind of appearance" ("look") you want to give the public should be put in writing. This usually ends up, according to the speaker, with a new trademark, packaging, influence on product appearance, offices and even in some cases the type of sales personality employed.

During the discussion period, Lippincott was questioned concerning color for appliances. In reply, he said, "There is no simple or easy answer to the color problem. Let the industry agree on one

to Page 69 →

Top photo records a session of the Gas Heating Division during IAM convention. Photo below shows representatives of the Oil Heating Division at work.





STEELCASE INC

adds to individuality of new
CustomLine with increased
variety of custom colors*

Introduced for the first time this month, the new Steelcase Custom-Line offers greater individuality by providing for a wide choice of interchangeable styling features like hardware and legs. New colors add to the variety of styling combinations now available and provide further opportunities for individuality. These colors were created in our studio to enhance the already popular Sunshine Styling colors in the Steelcase line, and their immediate success in several leading administration buildings indicates again that the right finish increases acceptance and saleability.



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Makers of the famous [®]Guardsman Finish and [®]Guardsman Cleaning Polish

THE BETTER THE FINISH THE BETTER THE BUY



KEYNOTE SESSION saw the following at the speakers table. From left to right are Pauline Duncel, Dr. Reed, Leonard Raulston, William B. Creek, and S. B. Rymer, Jr., who is not shown in this photograph.

gray (with some warmth or glamour) if they hope to simplify the problem. Three colors and white should answer most problems."

During the marketing conference, W. S. Peterson, manager of Market Research, Hotpoint Company, Chicago, discussed his company's methods of forecasting for the future market (a recent comprehensive Hotpoint survey has attracted much attention throughout the industry).

Forecasting is important

Four important points included in the forecasting procedure are:

1. Forecast industry sales (all fuels)
2. Forecast the individual company's share
3. Study of replacement market
4. Study of the new purchase market

One interesting comment by Peterson was that they are going to plan future forecasts on the basis of a twenty year period instead of the present ten.

Roundtable conference

Tuesday morning's program consisted of a roundtable conference with the subject "Business as an Ally of Government." This session included several government officials who outlined the principal functions of their departments as they affect the major appliance industry. Included in the group were Horace B. McCoy, administrator, Business and Defense Services Administration, Charles E. Sigety, deputy commissioner, Federal Housing Administration, Edward F. Phelps, Jr., assistant director

for Stabilization, Office of Defense Mobilization and Donald A. Hipkins, deputy administrator, Small Business Administration.

Kitchen equipment session

On Tuesday afternoon when the appliance manufacturers met in division sessions, your *finish* reporter attended the kitchen equipment division meeting which was presided over by J. H. Makemson, executive vice president, Geo. D. Roper Corp., Rockford, Ill. Included in the program were "An Analysis of the Major Appliance Industry" by Kenneth L. Block, management consultant, A. T. Kearney & Co., Chicago; "Kitchen Color Simplification Program" as discussed by John R. McCord, director of public relations, Ferro Corporation, Cleveland, and C. R. Smedley, director of color research, The Glidden Co., Cleveland; and "The Trend Toward Built-Ins" as discussed by representatives of the appliance manufacturers and the kitchen cabinet producers.

Percentage Distribution By Color

Color	— Per cent of Total —	
	Cabinets	Dishwashers
	(Front Panels)	
White	18.7%	—%
Petal Pink	28.3	26.5
Turquoise Green	21.7	21.9
Canary Yellow	19.4	25.3
Woodtone Brown	7.9	21.2
Cadet Blue	4.0	5.1
	100.0%	100.0%

Based on figures released by C. W. Theelen, Manager of Customer Relations, Major Appliance and T.V. Receiver Division, General Electric Company, Louisville, Kentucky, covering GE cabinet & dishwasher sales for first 8 months of 1956.

The report by McCord and Smedley on color was based on a special color conference held in mid-October as an exploratory meeting under the auspices of the Institute.

Shown at the Washington Year-End meeting were two suggested possibilities for color standardization. They were "gray neutral" and "yellow." In referring to the color simplification work, McCord said, "Color is with us! The color simplification committee favors voluntary action and is trying to develop one or two colors around which there may be some semblance of coordination or cooperation."

Mr. Smedley demonstrated the "harmonizing gray" background with a wide variety of appliance colors superimposed. He also showed the "compatible yellow" as a background with a variety of decorator colors superimposed.

Mr. Smedley feels that the stronger decorator colors are in general "fad" colors that won't last over a period of time. "Present sales in decorator color lines," he said, "show yellow, green, gray and pink as strong. Percentages of preference vary from year to year but yellow is usually a top color."

Tom Armel, also of Glidden, referred to the fact that they have 600 white colors (or shades of white) manufactured in 12 paint plants.

It was indicated during the discussion that standardization, if proved feasible, would lead to a cost saving. It is apparent that one of the major costs of producing an industrial organic finish is in meeting the exact color specification requirements of a product manufacturer.

During the discussion, E. J. Sorenson of Hotpoint suggested that there may not be a single answer to the color problem but there could be logical simplification. He said Hotpoint started out with 25 color suggestions and then simplified. His company's color sales ratio has gone from zero per cent to 20 per cent in two years for kitchen appliances.

As the session ended one suggestion made was that "standards" be offered for cooperation and coordination and then let the "fad" colors ride on their own weight.

Although Cincinnati has become more or less the "home" for the semi-annual meetings of IAM, comments from those in attendance at the Washington meeting would seem to indicate that the choice of meeting places for the 1956 Year-End Conference won the hearty approval of those who attended.

New

Supplies and Equipment

REDESIGNED TROLLEY FOR CONVEYOR SYSTEMS



A redesigned trolley for more efficient operation of cable conveyor systems that also permits easier installation, adjustment and maintenance, is announced. Wheels on the redesigned trolley may be quickly and simply changed by removing a bolt, grip nut, or lock washer and plain nut. Side plates of the new trolley have been radically redesigned for simplicity, strength in suspension and thrust, and ease of assembly. Two new standard attachments, which together will provide the basic suspension for most applications, are available with the new trolley. The stud attachment has a vertical hole which accommodates a $\frac{3}{8}$ -inch stud from which a variety of stationary or rotating carriers may be suspended. The pendant attachment has a horizontal $\frac{3}{8}$ -inch hole through which a clevis pin is most commonly inserted. Both attachments may be bolted or permitted to swing. Tipp Mfg. Co., Tipp City, Ohio.

MINIATURE FLEXIBLE COUPLING IS IDEAL FOR FHP MOTORS

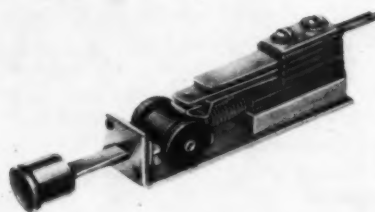
A new miniature flexible coupling has been especially developed for sub-fractional horsepower motors, and other small units such as solenoid units in dispensing machines, coin operated devices and similar equipment. Rated at 1/20 hp. at 1750 rpm., the full range is from .003 hp. at 100 rpm. to .103 at 3600 rpm. Dimensions are $\frac{5}{8}$ " O.D. by $\frac{3}{4}$ " overall length. Bore sizes are $\frac{1}{8}$ ", 3/16", $\frac{1}{4}$ " and $\frac{5}{8}$ ". Bodies are standard in die cast aluminum but can

also be furnished in brass. The new miniature flexible coupling never requires lubrication and is otherwise maintenance-free for the normal life of the equipment. There is no wear on the metal jaws, since the load is transmitted by cushion compression. Lovejoy Flexible Coupling Co., Dept. FHC, 4801 W. Lake St., Chicago 44, Ill.

CLOSE-TOLERANCE LIMIT SWITCH

Rapid, precise adjustment to close operating tolerances, and excellent repeatability in high-speed or low-speed operation, are features of the Model LS-1 limit switch. Exact limitation of rotary motion is assured by the use of two cams that are driven along a rotating leadscrew to actuate two single pole-double throw precision snap-acting switches. The leadscrew is connected to the system to be controlled by suitable gears. Adjustability of 1 part in 3400 (.03 per cent of the full range), and repeatability of plus-or-minus 5° of a 360° revolution of the leadscrew (.04 per cent), are features of the unit; the limit of travel for the cams is from 1 to 70 turns of the leadscrew. Cam settings are read directly on the scale bar, which is calibrated in revolutions of the leadscrew, and is conveniently placed for visibility and use. Arch Instrument Co., Inc., 101 Holmes St., North Quincy, Mass.

PUSH BUTTON SWITCH



A new momentary action type push button switch has been introduced. The plunger is mounted on phenolic rollers, resulting in easy, smooth operation. Requiring only 2 31/32" depth behind the panel, small size of the switch makes it well suited to applications where space is limited. Palladium contacts are standard, 3 ampere or 5 ampere, 110 volts a-c (non-inductive). Donald P. Mossman, Inc., Brewster, N. Y.

NEW SMALL GRINDING WHEEL



Announced, a new smaller diameter flexible coated abrasive wheel for contour grinding and polishing. Formerly made in 6 inch to 17 inch diameters, and 1 to 3 inch widths, the new model is only 3 inches in diameter, 2 inches in width and in various grits from fine for polishing and buffing, to coarse grits for deburring, smoothing flash and chamfering. The new 3-inch diameter is for sharp bends, contours of small radii and confined areas such as the inside of tubing. Simple to set up, it mounts on any spindle or chuck of present portable or stationary equipment. Merit Products, Inc., 4023 Irving Place, Culver City, Calif.

MILL LINING BRICK

A booklet describing standard mill lining brick, special door frame and door brick sets, and giving instructions on how to shape brick, is available. Included also is a brief description of the Isostatic Process for brick and grinding media production. A numbering system used by the firm to identify their product, and to simplify ordering, is contained within the booklet. Full instructions on how to shape brick on the job is also given. LZF Industrial Ceramics Co., 275 Kalamath St., Denver 23, Colo.

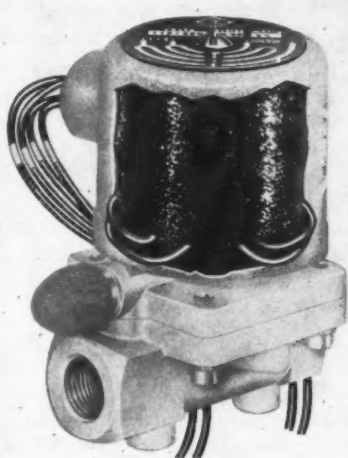
BOOKLET DESCRIBES

THERMOSTATS

A brochure, illustrating and describing thermostatic controls and devices, is available from the manufacturer. Fourteen basic models are covered in the booklet, and the literature also includes a temperature conversion chart, enabling the reader to convert temperatures from Centigrade to Fahrenheit, and visa versa. Stevens Manufacturing Co., Lexington and Mansfield, Ohio.

MULTI-VOLTAGE COIL

A multi-voltage coil, featuring flow control of twelve common fluids, in forty-two different valve styles and capacities, and with any one of seven electrical circuits, is now obtainable.



The valves range from 7/64" to 1 1/2" in port sizes, and are suitable for temperatures up to 225° F. A data plate, showing the correct hook-up for each electrical requirement, is supplied with each unit, and color-coded lead wires provide easy identification. Temperature rise, according to the manufacturer, is extremely low, less than 1/2 the allowable limit, and the insulated magnet wire is impregnated with varnish and oven-baked for maximum moisture resistance and heat dissipation. Jackes-Evans Manufacturing Co., Controls Division, 4427 Geraldine Ave., St. Louis 15, Mo.

SOLENOID VALVE TO HANDLE CORROSIVE FLUIDS AND GASES

A technical bulletin has been released which describes a new 1", 2-way solenoid valve which is constructed to handle corrosive fluids and gases. According to the manufacturer, the valve has only two working parts consisting of a diaphragm and a stainless steel core, is compact, mounts in any position, and is available for normally open or normally closed operation. The unit operates on 10.5 watts a-c current. Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.

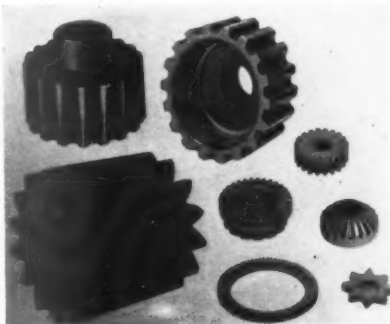
PAINT HEATER FEATURES REMOVABLE PAINT TRACT

A new paint heater, featuring a removable paint tract, is said by the manufacturer to provide the painting industry with its first economically-maintained paint heater. The paint tract

is a heated chamber within the unit where the temperature of the paint is raised. The parts are not affected by intense heat, and periodic inspection of the tract may be made quickly by removing it from the unit. It is claimed by the makers that less thinner is used in the process, and solids are higher and film thickness greater, resulting in greater coverage per gallon of paint. The unit also requires less air pressure. Binks Mfg. Co., 3124 W. Carroll Ave., Chicago, Ill.

IMPROVED GEARS

Gears made from powdered metal by an improved process are being produced. The gears are rough-formed by pressing powdered metal into dies, submerging them in an oil bath, heat-treating them to customer specifications, and finish-grinding them to exacting requirements to meet precision performance conditions. The cost is 30 per cent below that of cut gears. Each metal particle



in the gear holds and retains the oil throughout the life of every gear to provide an automatic, permanent, built-in lubrication system. A. A. Specialty Gear Co., 12327 Edwin Court, Cleveland 12, Ohio.

COMPLETELY UNIVERSAL STEAM TRAP FOR UNIT HEATERS AVAILABLE

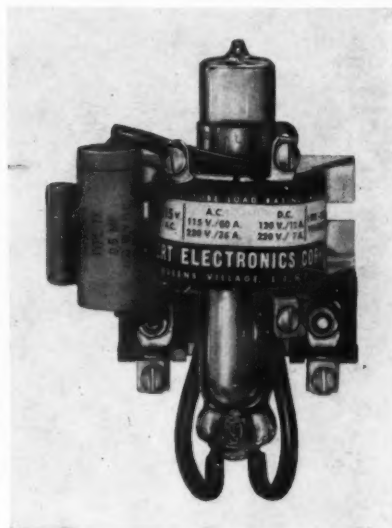
A small, light-weight, bucket-type steam trap for unit heaters, small processing machinery, and like applications is available in 1/2" pipe size, with a universal pressure range of 0 to 125 PSI. Developed for low pressure, high condensate rate applications where a smaller and inexpensive trapping unit is needed, the unit is said by the manufacturer to embody all of the outstanding features of the firm's line of steam traps. The makers claim that the trap is completely universal in pressure application, has faster warm-up, less wear, lower maintenance, and is capable of handling more condensate per hour without steam loss. Perfecting Service Co., 332 At-ando Ave., Charlotte 6, N. C.

FINISH FOR ZINC DIE CASTINGS

A new commercial finish for use on zinc die castings, embodying an intense, dull black finish, provides excellent corrosion resistant properties when applied on the appropriate conversion coating for the particular metal to be finished, according to the manufacturer. The process is designed to produce a uniform dense black finish on zinc, cadmium, or zinc-base die castings, and is said to be fast, usable at room temperature, requires no exhaust equipment, and features a cycling period which may be adjusted to automatic machine operation. Conversion Chemical Corp., Rockville, Conn.

NEW HI-POWER SENSITIVE RELAY

A new sensitive power relay has been produced that allows extremely low surge current through the actuating coil, preventing damage to fine instrument control contacts. It only requires a low .0035 Amperes from an external contact (thermometer, contact-meter, probes, etc.) to operate. Power amplification for this rugged relay is a high 17,300. The relay load rating is 60 Amperes at 115 Volts, A.C.; 35 Amperes at 230 Volts, A.C.; 12 Amperes at 440 Volts, A.C.; on motor, general purpose or tungsten lamp loads. The relay employs an energizing coil in a resonant circuit so that the external contact need only carry sufficient power to detune the circuit. The simple, hermetically



sealed, mercury-to-mercury contact 60 Ampere relays as well are reported to be maintenance-free, with only one non-wearing moving part — no mechanical parts — to wear out, repair or replace, and no pitting, sticking or corrosion problems. Ebert Electronics Corp., 212-26 Jamaica Ave., Queens Village 28, N. Y.



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PERU 11, ILLINOIS



NEW SURFACE CONTINUED

verted into a useful movement of a contact by use of a bimetallic element wound with resistance wire in conjunction with a modified bimetallic voltage regulator. Voltage from the voltage regulator is applied to the sensing element wire and the bimetal heater wire in series.

When the pan is cold, the pellet resistance is low and a relatively large current can flow in the bimetal heater winding. The current in the heater winding warms the bimetal and causes it to deflect toward a temperature adjusting contact and close a circuit.

The sensing pellet

As the pan warms, the sensing pellet resistance is increased, decreasing the current in the bimetal heater winding, reducing the deflection of the bimetallic element and allowing the contacts to open. Because of the small size of the bimetal element necessitated by the requirement for rapid response to changes in resistance of the sensing pellet the contacts operated by the bimetal are not large enough to handle the surface heating element current directly. These contacts therefore operate a silent relay which contains contacts of a size sufficient to break the high current, high voltage burner supply lines.

All elements of the control system proper (excluding the contacts which break the power line to the surface element) are operated by low voltage. The low voltage is particularly useful in that it reduces the insulation required in the sensing element, the innerconnecting wires and bimetal heater winding.

Need little insulation

Because of these reduced requirements, very thin insulation can be used, permitting rapid flow of heat from the pan to the sensing element resistance wire and from the bimetal heater wire to the bimetal, thus assuring rapid response in bimetal contact position to changes in temperature of the pan.

The low voltage system requires a transformer to reduce line voltage to control system voltage, but one transformer can handle several controllers. In addition, because the control unit itself reduces the heating power by periodically opening and closing contacts, the surface heating element used with the controller can be a less expensive single wattage, high heat capacity element.

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Formability of metals

basic characteristics of metals, materials for cold forming, and divisions of cold forming methods are analysed in this four part special report by Spencer

by *Lester F. Spencer* • CONSULTANT IN METALLURGY

WITHIN the stainless field types 302, 410 and 430 are widely used materials for cold roll forming; type 430 is used quite extensively for automotive trim. The only difference in roll forming this material, as compared to the carbon steels, is that the number of rolls employed to produce the specific shape is increased so as to compensate for the greater spring back. In addition, speeds are reduced; a value of from 25 to 75 fpm is employed. The thickness limitation on the stainless steels is usually 0.080 inches, and all inside radii are preferably at twice the thickness of gage to be roll formed.

Roll forming high nickel alloys

The high nickel alloys such as monel, inconel, etc. are slightly more difficult to roll form than experienced with the stainless steels. This also means careful calculation of reduction per roll and slower speeds. Magnesium can also be successfully roll formed. However, the strip should be first subjected to a moderate amount of heat; this is accomplished by means of a battery of infrared lights, usually mounted on the entry table and on top of the roll stands for the purpose of preheating the stocks as well as the rolls.

Suitable aluminum alloys

The nonheat treatable alloys of aluminum such as 2S, 3S and 52S can be roll formed in all tempers. The heat treatable alloys such as 17SO, 17ST, 24SO and 24ST are also roll formed; however, greater care and slower speeds must be employed. The size limitation on the softer grades of aluminum is that roll forming in thicknesses less than 0.015 inches is difficult, due to the inability of the material to hold its shape. The harder aluminum grades can be run thinner than specified above, while clad section as thin as 0.005 inches have been successfully rolled formed.

Where coated stock is to be roll formed, one prerequisite is that the coating be hard and well bonded to the base material. Electrogalvanizing and electroplating with nickel, chromium, brass, zinc, cadmium and copper most easily meet these requirements. If the above mentioned prerequisite is not observed, cracking or peeling of the coating may result. There is a limitation as

to the degree of bending that can be done on these coated materials. Thus, chromium and nickel plated material is confined for the more simple shapes, whereas both zinc and cadmium plated material can be formed to shapes having more complicated shapes. The progressive steps of a clad material are illustrated in Figure 10.

Single action presses are also used

Photo Courtesy Reynolds Metals Co.



FIGURE TWELVE: this 8 foot, 300 ton Bertsch 3 roll former is used for bending sheet and plate up to $\frac{3}{8}$ inches thick. Spacing of the third roll is adjustable to produce varying degrees of curvature.

Photo Courtesy Armco Steel Corp.

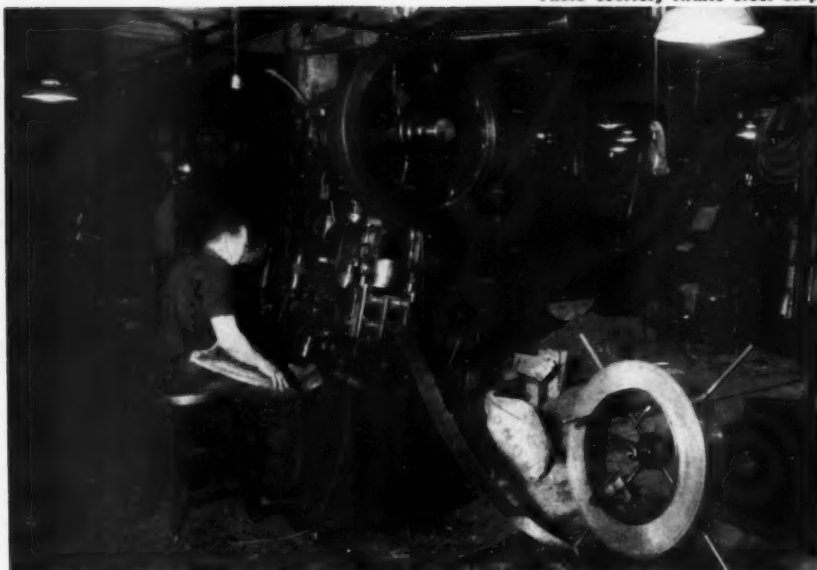


FIGURE FIVE: inclined press where combination of blanking and cupping are performed at a relatively high rate of speed.

FORMABILITY CONTINUED

where bending operations are involved; however, their use is limited. Where design permits its utilization, a two operation step is usually involved consisting of a preform and finish form. Contour flanging can be performed on a single action, a double action or by hydro rubber press. The latter method is widely used in the forming of both the aluminum and the austenitic stainless steels. Rubber press forming has the added advantage in the forming of relatively thin gage stock, with smoother and more accurate contours than that realized with any other method.

Forming of contoured sections

In the forming of contoured sections, either the three roll bender and its modifications, the power bender or the stretch press can be used. Roll bending is preferred for sections of consistent radii or where the metal is thick in proportion to the height of the section. The weakness of this method is that wrinkles may form on the compressive side of the bend. Where radii are not constant, the power bender is employed. In this method a pressure shoe follows the section while it is being formed.

One feature of power bending is that varying cross sectional areas within the part can be contoured formed. Stretch forming is being favorably received due to the absence of wrinkling and a better control of springback. The stock is gripped on both ends, and while the part is under tension, it is wrapped around the form of the desired shape. The

amount of stretch depends upon the thickness and the yield strength of the material along with the height and shape of the part.

Building is within the operational classification involving compression. However, it often follows a procedure such as deep drawing. Mechanical bulging methods use either a segmented die or a rubber punch; the former method will produce slight flats on the surface of the bulged surface which may be objectionable. Rubber punches will result in a smooth contour. However, this die design is usually limited to small or medium production. A maximum of about 4,000 pieces are realized before the punch must be replaced. Hydraulic bulging is quite suited for intricate shapes. Correct volumes and pressures, proper venting and the prevention of leakage are prerequisites within the system, however.

Drawing action press operations

In drawing, there are two distinct operations, the initial draw from a developed blank which is termed cupping and the further reductions of the initial cup which is termed re-draw. The drawing operation may be a simple reducing operation where little loss of thickness on the sides of the shell is experienced, or, it may be an ironing operation where the actual side wall thickness is reduced. A single ironing operation may reduce wall thickness as much as 50%. It is often performed in mild steel drawing, and an excellent example is the deep drawing of cartridge cases.

In the drawing of a cylindrical shape,

the metal is forced into the die by a punch, causing compressive stresses in the peripheral direction on the rim of the blank and tensional stresses along the side walls. These compressive stresses tend to buckle or wrinkle the rim of the formed section. However, if the draw is shallow, this defect may be eliminated by an ironing action in that gap between the punch and the die. More frequently, the hold down pressure pad is adjusted so that wrinkling will not occur. Too little hold down will not remove the wrinkles, and, too much hold down may cause the bottom of the partially formed piece to fracture.

Recommendation of punching

The punch determines the contour of the drawn section, the walls of the punch blending into the punch nose by a radius. Insufficient radius may cause rupture of metal at that point; whereas, too large a radius will result in puckering. This latter condition is of considerable importance in light gage material. The recommended punch radius

Photo Courtesy The Yoder Co.

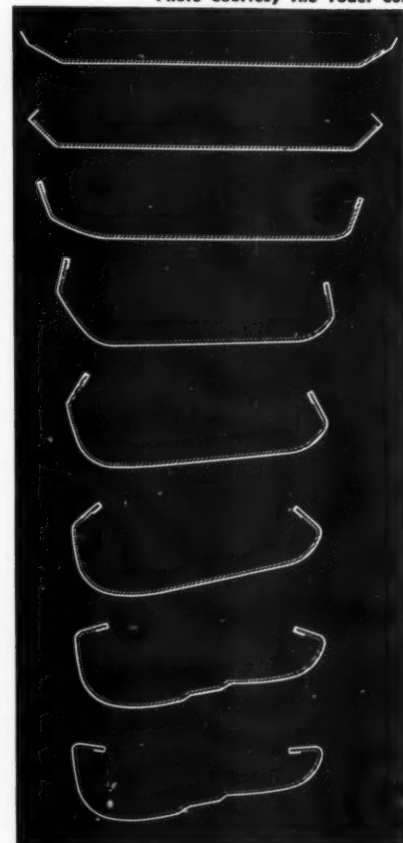


FIGURE TEN: successive steps in roll forming a bi-metal section. The inner material is cold rolled steel. The cladding is stainless. Production is at a rate of 11 fpm.

a small detail yes



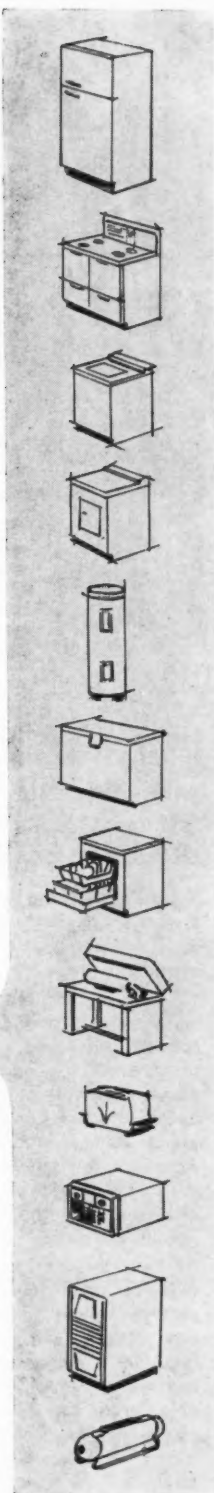
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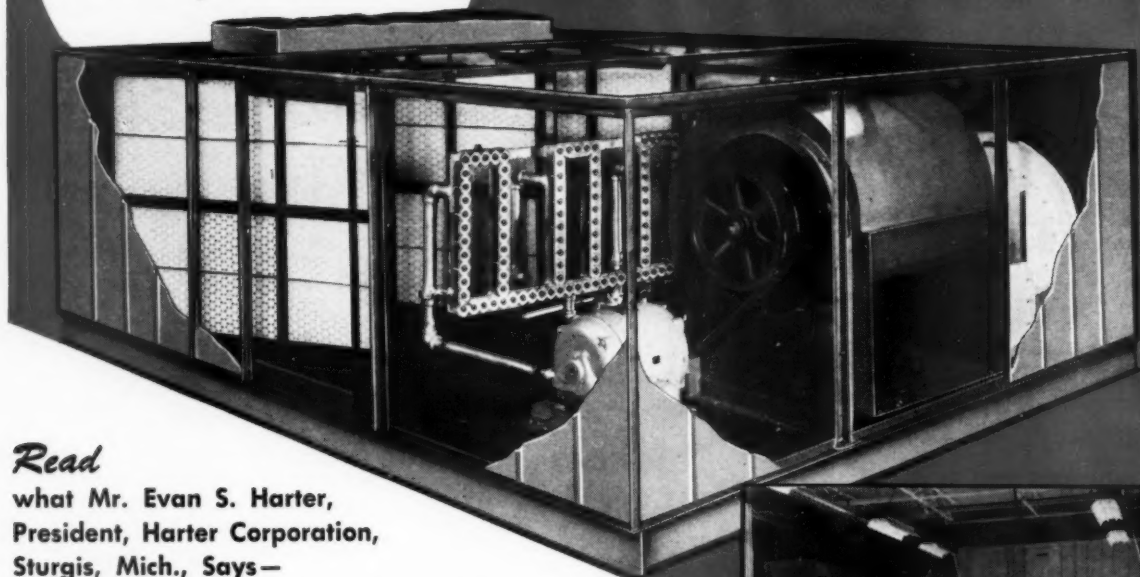
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"By the installation of these air make-up units we are now able to satisfy air replacement requirements in any portion of our plant without affecting other areas or operations. The reason we chose to install several units of different capacities was so that we could satisfy our exact exhaust requirements regardless of the amount of equipment that was in operation.

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3. The lack of vacuum in the building has made it possible for people to work in comfort and without draft along windows and walls.
4. Doors of the building can be opened and closed by employees or automatic door openers without danger to em-

ployees or the necessity of frequent repairs of doors or door frames.

5. We have been able to maintain an even distribution of dampness in the different areas that were previously affected.

"The air make-up units have supplied the proper volume of fresh and heated air to the closely controlled temperature necessary to maintain the operation in each phase of production."

(Signed) Evan S. Harter
President



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is about 4 times the metal thickness. The die component consists of a narrow ring which permits the drawn section to be pushed through to a predetermined depth. The drawn shell is either pushed through the die or ejected by the use of an ejector pad.

In the latter case, the shell will have a flange near the top of the shell, whereas, the former procedure will result in a straight walled shell. The die radius, which is from 5 to 10 times the metal thickness, is quite important. Too small a radius may cause breakage through cold working; whereas, too large a radius will cause excessive wrinkling in that area.

The permissible reductions will vary with the material type and the physical conditions of equipment, tools, etc. In the drawing of the copper base alloys, reduction of 45% can usually be obtained before an intermediate anneal is required. It must be realized that quite a number of alloys are within this grouping, each alloy type having individual characteristics and, thus, varying in drawability. In the aluminum alloys, reductions as high as 40% can be obtained with both 2SO and 3SO considered ideal for draw work. The higher strength alloys can also be formed with considerable success. However, pre-determination of permissible reductions prior to the intermediate anneal must be determined.

Drawing stainless steel

In the drawing of the stainless steels, type 302 can be formed with reductions as high as 50%, the alloy type 305, due to its lower cold working rate, being drawn to values exceeding 60%. In considering mild deep drawing steels, stretcher strain markings may prove troublesome. In the copper base alloys, such as the brasses or the stainless steels, the difficulty of stress cracking may be experienced. Both of these phenomena have been discussed.

Regardless of material, it is necessary to determine the successive draws and the placement within these operations of the intermediate anneals. However, it must be realized that although the anneal will regenerate the material and permit further working, the reductions permissible are usually about $\frac{1}{2}$ of that obtained in the initial cupping operation.

As in other press working operations, the power required along with the rigidity of equipment will be dependent upon the strength of the material and the resistance for deformation that is encountered. In the latter case, this re-



FIGURE THIRTEEN: press forming stainless steel — cupping operation.

sistance increases as the material is cold worked. Thus, such materials as nickel, inconel, monel metal and the stainless steels offer greater resistance to deformation than do the mild steel or the non-obtained in the initial cupping.

Summary of the report

It briefly can be stated that the primary requisite in the successful forming of material in the press room is a knowledge and respect for the properties of the specific materials worked. In many instances, further information is obtained from a metallurgist within the individual company. When this cannot be done, the advice of the materials vendor is always available. In addition, the success of press working is a combination of equipment, procedures, tooling and lubricants, with experience as the best teacher. Thus, on many occasions, experimentation is required to work out a particular sequence of operations, utilizing to the full advantage the factors that have been given.

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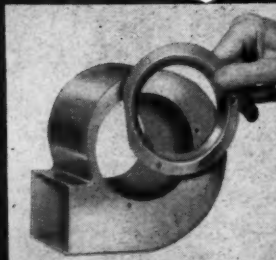
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GAMA WATER HEATER UNIT ELECTS FOUR NEW MEMBERS

Four new firms have been elected to membership in the gas water heater division of the Gas Appliance Manufacturers' Assn., according to Frank R. Osborne, division chairman. Total membership now stands at 52. Those admitted are: The Basford Manufacturing Co., 235 15th St., San Francisco, Calif.; W. L. Jackson Manufacturing Co., 1216-1226 E. 40th St., Chattanooga, Tenn.; National Steel Construction Co., 500 Myrtle St., Seattle, Wash.; and Sands Manufacturing Co., 5407 Sweeney Ave., Cleveland, Ohio.

ELECTRONICS INDUSTRY REPORTED AHEAD 15%

The dollar volume of the electronics industry rose 15 per cent in 1956 over 1955 despite some decline in TV set production, James D. Secrest, executive vice president of the Radio-Electronics-Television Manufacturers' Association, said at a "Business Forecast Symposium" of the U. S. Chamber of Commerce. He predicted continued growth in 1957.

"The outlook for 1957 is that at least another seven million black and white television receivers will be made and sold, and that color TV set sales will total several hundred thousand," he said.

One of the most significant developments in the television market in 1956 was the sudden emergence of the portable TV receiver. While approximately 250,000 were made in 1955, last year's figure is expected to total 1.5 million. In 1957, this production may be nearly doubled. One obvious result of this trend has been a decline in the average

price of the TV receiver, and an overall loss in TV revenue.

In reflecting on the radio set activity during the year, the RETMA spokesman said: "The output of all radios, except auto sets, rose more than 20 per cent last year over 1955, with portables taking the lead by an increase in excess of 40 per cent. Transistor-equipped portables were produced in quantity for the first year, numbering about 900,000. Auto sets declined more than 20 per cent due to the cutback in auto production."

700 NEW LEWYT DEALERS

The Lewyt Corporation has added about 700 new dealers to handle its vacuum cleaners, Walter J. Daily, vice president, announced.

Most of the dealers are located twenty-five or more miles from "discount house" competition. Their suburban location gives them a chance to make reasonable profits, and these should account for 15,000 more cleaner sales by the end of a year, Daily said.

RCA WHIRLPOOL EXPANDS FIELD SALES ORGANIZATION

Appointments to the expanded field sales organization for marketing RCA Whirlpool home appliances of Whirlpool-Seeger Corp., and three new regional sales offices, were announced by Jack Sparks, director of sales. Total field personnel has been approximately doubled in order to service RCA Whirlpool full-line distributors. Each of eight regions is divided into two or three districts. Districts, which have three to five distributor territories, are served by district managers specializing in one product group or sales activity. This organization concentrates services of field sales staffs on fewer distributors in each region, and permits increased merchandising emphasis on individual products, Sparks said.

WESTINGHOUSE OFFERS NEW DEALER PROTECTION PLAN

Westinghouse Electric Corporation announced today a unique plan designed to level some of the production "peaks and valleys" of room air conditioners.

The company, through its distributors, will buy back from dealers on July 15, 1957, a number of room air conditioners equal to the number each dealer had purchased and accepted in the period January through May, 1957.

The purpose of the program is to encourage non-seasonal buying, and thus steady production of units before the arrival of warm weather.

ARI ADOPTS RATING AND TESTING PROGRAM

An expanded program which includes rating and testing air conditioning and refrigerating equipment, and formulation of policies which will give meaning and authority to ARI ratings, is being adopted by the Air Conditioning and Refrigeration Institute, to the end that the public and trade may have authoritative guidance as to performance capabilities when they consider installation of such equipment. The program was announced by George S. Jones, Jr., managing director of ARI, following discussions at recent meetings of a number of the Institute's Product sections.

Rating and testing of room air conditioners according to ARI standards was announced by the Room Air Conditioner section of the Institute recently as the first step in the program. Many of the 22 manufacturers of these units, who entered into the program, have included the ARI-rated capacity of their 1957 models in literature and advertising covering these models. Under the program, purchasers of room units will be able to make comparisons of cooling capacities of various models on an established basis of BTUs as rated under the ARI standard.

PAINT FEDERATION PLANS RESEARCH INSTITUTE

Preliminary details of a plan to establish a Paint Research Institute were announced by Milton A. Glaser, president of the Federation of Paint and Varnish Production Clubs.

In commenting on the progress of the proposed plan, Glaser stated that the Long Range Planning committee of the Federation had been investigating arrangements and sites for such an institute for the past three years. Members of the committee have conferred with educators and research people in all parts of the country. They have visited and studied existing institutes in order to ascertain costs, facilities, and other arrangements necessary for a Federation institute. The preliminary recommendations of the Long Range Planning committee have been approved in principle by the Federation board of directors.

The purpose of the institute would

be to conduct broad research and to foster technical education for the benefit of the entire decorative and protective coatings industry.

The members of the Long Range Planning committee are: Newell P.

Beckwith, Rinshed-Mason Co.; Hiram P. Ball, Ball Chemical Co.; Milton Glaser, Midland Industrial Finishes Co.; C. Homer Flynn, executive secretary of the Federation; and Calvin J. Overmyer, Elliott Paint and Varnish Co.

including built-in models. This tops the 191,000 figure for September, previously the high month for 1956, but is 6.8 per cent below the 210,300 recorded for October of last year. For ten months, the latest total, 1,733,000, is down 10.1 per cent from the 1,928,600 shipped in the same period earlier.

MAYTAG CELEBRATES PRODUCTION OF 10-MILLIONTH WASHER



The 10-millionth Maytag washer is christened as it rolls off the production line. A flagon of water is wielded by Mary Margaret Christianson, home service director. L to r: B. J. Hank, AHLMA president, Roy A. Bradt, Maytag vice president, Miss Christianson, and Gerry Rietveld, Maytag Queen.

An historic production milestone for The Maytag Company, Newton, Iowa, was achieved Thursday, Nov. 29, when the 10-millionth Maytag washer was scheduled to come off the assembly line at the automatic washer and dryer plant of the 63-year old appliance manufacturing firm.

Aerial bombs signaled completion of the machine, and visiting dignitaries, suppliers, and company officials staged a brief ceremony as the washer moved down the assembly line.

An open house and tours for the community were sponsored by the Maytag Management Club, followed that evening by an all-employee party and dance sponsored by the Maytag Labor-Management council.

B. J. Hank, president of the American Home Laundry Manufacturers' Association, spoke at a buffet luncheon Thursday noon in the Hotel Maytag ballroom for special guests and out-of-town visitors for the occasion. Present were representatives of the National Appliance, Radio, and TV Dealer Association, Iowa Manufacturers' Association, National Association of Manufacturers, Iowa Development Commission,

U. S. Chamber of Commerce, United Auto Workers, Newton Chamber of Commerce, mayor, and other civic leaders.

In his tribute to Maytag and the Home Laundry Industry, AHLMA President Hank said, "It seems only fitting that Maytag should be the first company to reach that production goal. First, Maytag ranks as one of the oldest companies in the home laundry appliance industry. Secondly, The Maytag Company has enjoyed a number of other 'firsts' in washing machine engineering, inventiveness, and development. As a result, Maytag is not only the leader today in the total number of washing machines made, but also a leader in the number of washing machines in use!"

OCTOBER BEST 1956 MONTH FOR GAS RANGE SHIPMENTS

Manufacturers' shipments of gas ranges in October were the largest for any month last year, although below the 1955 figure, the Gas Appliance Manufacturers' Assn. reports. In October 1955, 900 gas ranges were shipped, not

NEMA REPORTS ELECTRICAL APPLIANCE DISTRIBUTOR SALES

The National Electrical Manufacturers' Assn. has released the following figures for September, and through the third quarter of the year, covering distributor sales of major electrical appliances to dealers: standard electric ranges, September, 82,385, nine months, 862,333; complete electric household refrigerators, September, 64,671, nine months, 565,920; electric storage water heaters, September, 55,845, nine months, 513,895; and electric freezers, September, 51,978, nine months, 522,326.

MAY SELECTED AS PLUMBING, HEATING, COOLING MONTH

May, 1957 will be Plumbing — Heating — Cooling Month. This announcement was made by Wilbur S. Hokom, chairman of the special coordinating committee for Plumbing — Heating — Cooling Month. This committee is a sub-committee of the All-Industry Plumbing and Heating Modernization committee of which William A. Landers is chairman.

An important factor in influencing the committee in favor of May as the special emphasis period in 1957 is the fact that Operation Home Improvement has designated May as "Better Your Living Month," meaning that all of the promotional efforts of the building industry, mobilized by OHI, will be concentrated in May.

PMI ANNOUNCES ANNUAL TECHNICAL MEETING

Pressed Metal Institute will hold its three day Annual Spring Technical Meeting at the Hotel Carter, Cleveland, Ohio, March 6-8, according to H. A. Daschner, PMI's managing director. Between 300 and 500 stampers are expected to attend.

The program for Plant Safety Day on Wednesday, March 6, will cover safety practices from Management Side, Tool Designers Side, and the worker's opinion. PMI's Annual Safety Award will be presented to those plants who had no lost-time accidents during the previous year. Thursday's session will

concentrate on Production and Design techniques of special interest to stampers. The annual banquet will be held Thursday evening. Two plant tours are scheduled for Friday morning, March 8. A panel and round table discussion is scheduled for Friday afternoon.

STAMPING DESIGNER CAN WIN \$500.00 AWARD

Every stamping designer in the world is eligible to make an entry to the Pressed Metal Institute's "John Woodman Higgins Redesign Award," says H. A. Daschner, managing director of Pressed Metal Institute. This award, an all-expense trip to the March PMI meeting in Cleveland, plus a \$500.00 check is made in commemoration of the 50th anniversary of the Worcester Pressed Steel Company, Worcester, Mass., in honor of John Woodman Higgins, Worcester's chairman of the board. (See page 67, December *Finish*.)

No formal paper or entry form is required. There are three criteria. Successful stamping production of a part previously manufactured by another process; originality of the design; significant production cost savings as compared to the other process previously used.

Send your entries to Pressed Metal Institute, 3673 Lee Road, Cleveland 20, Ohio, to the attention of H. A. Daschner.

QUICKIE MANUFACTURING CO. ADDS PRODUCTION FACILITIES

Quickie Manufacturing Co., maker of Quickie kitchen stools and other household products and kitchen aids, has launched an expansion program at its plant at 20th and Oxford Sts., Philadelphia. Jerry Hovnanian, national sales manager, reports. The program of expansion, to be completed in the first half of 1957, will add three additional automatic assembly lines for household products, the report states.

WRINGER WASHER BOOMS LAUNDRY APPLIANCE SALES

Dealers not displaying conventional (wringer) washers are losing automatic washer sales, according to Harold P. Bull, vice president of Norge Division, Borg-Warner Corporation. "Two of every 10 housewives who set out to buy a wringer washer end up with an automatic washer," he stated. Despite this fact, he reported that Norge wringer washer sales to dealers are 19.8 per

cent ahead of the corresponding period (10 months) of 1955.

In a separate statement, Judson S. Sayre, Norge president, pointed to the fact that automatic washer factory shipments will exceed those of refrigerators for the first time in history this year.

"Automatic washer factory sales will reach 3,300,000, compared with a refrigerator total of 3,200,000, and realize an 18-year goal," declared Sayre, who pioneered the automatic washer in 1938.

Refrigerator sales will jump back to 3,350,000 units in 1957, but automatic washers will keep in front with a total of 3,500,000 sales, in the opinion of Norge executives.

NEW FORM OF FRANCHISE FOR RCA-WHIRLPOOL DISTRIBUTORS

A 12 month's franchise for all distributors of RCA-Whirlpool appliances, said to be the first of its kind in the major appliance industry, was announced December 3rd by John L. Bricker, vice president of Whirlpool-Seeger Corporation. The announcement was made on the first of a three-day "1957 Parade of Appliances," at which the first full line of RCA-Whirlpool appliances was unveiled before the company's independent distributor organization.

The new distributor agreement is effective immediately. It is renewable annually "unless either party elects not to renew, in which event written notice will be given 90 days prior to the date of the expiration of the franchise." The new Whirlpool-Seeger franchise replaces the previous 30-day cancellation form. Bricker states that the new franchise "balances private legal rights with corporate social responsibilities."

NEW BRYANT HEADQUARTERS AT INDIANAPOLIS, INDIANA



This new stone and steel building is the headquarters for Bryant Manufacturing Co., Indianapolis, Ind. Here the company houses its general office staff, engineering, and research facilities.

PLANT MAINTENANCE AND ENGINEERING EXHIBIT

The 8th Plant Maintenance and Engineering Show, to be held at the Public Auditorium in Cleveland, Ohio, Jan 28-31, will have 407 companies demonstrating 8,000 products in exhibits valued at \$5,000,000, according to advance announcement by the show's management, Clapp & Poliak, Inc., New York City.

More than 20,000 executives from companies throughout the U. S. and from abroad, are expected to attend.

The development of automation and automatic procedures appears to be the principal cause for growing interest in maintenance problems, according to the show's management.

Conference sessions, including special sessions for industries such as metal working, chemical, metal fabricating, steel, etc., are expected to attract 2,500 engineers.

APPLIANCE MANUFACTURERS TO EXHIBIT AT CHICAGOLAND FAIR

Three leading appliance manufacturers will be among the exhibitors at the Chicagoland Fair, business, industrial, and cultural exposition to be held at Navy Pier, Chicago, June 28-July 14.

Westinghouse Electric Corp., Hotpoint Co., and Sunbeam Corp., will participate in the Chicagoland Fair, according to Richard Revnes, Director of the exposition.

Sponsored by the Association of Commerce and Industry, the Chicagoland Fair will feature five miles of colorful exhibits and pageants extolling Chicago as a "land of opportunity," and saluting the city's progress. An estimated 500,000 persons are expected to attend the 17-day Fair.

Ronald N. Campbell, Bryant president, said: "In addition to providing much-needed general office space, the new building will enable us to conduct one of the most comprehensive sales

and engineering training programs in the heating and air conditioning industry."

In addition to the office building, Bryant operates a plant at Indianapolis, primarily engaged in the making of furnaces. The company also operates plants at Tyler, Texas, New Lexington, Ohio, and Peoria, Illinois.

WELDING SHOW TO BE HELD AT PHILADELPHIA

The fifth Welding Show, an industrial exposition sponsored by the American Welding Society, will be held at Convention Hall, Philadelphia, April 9-11, it was announced by Joseph G. Magrath, national secretary. This is the first time the show is being held in a major industrial center. Previously, the show took place in Houston, Buffalo, and Kansas City.

During the same week as the show, the society will conduct its annual National Spring Meeting, from April 8 to 12, at the Hotel Sheraton, Philadelphia, when technical papers on recent research will be read. A feature of the 1957 meeting will be the co-sponsorship of three sessions by the Committee on Electric Welding of the American Institute of Electrical Engineers.

RDC REPORTS INCREASE IN APPLIANCE SALES FINANCING

Refrigeration Discount Corporation marked up a 27-per cent increase in appliance sales financing during its fiscal year, according to C. R. Brogan, president of ReDisCo.

"With the major appliance industry expanding vigorously, the demands for new credit and installment buying has increased substantially at both dealer and consumer levels," Brogan said. "To serve the demands of new Kelvinator and Leonard business, as well as other customers, we have been increasing our field staff and establishing new branch offices."

THE TREND SHOULD BE UP IN '57 — JEFFREY

Walter Jeffrey, Kelvinator vice president and general manager, has predicted that 15,176,000 major household appliances (refrigerators, freezers, ranges, home laundry equipment, water heaters, room air conditioners, and dishwashers) were sold during 1956, for a slight increase over 1955. Sales of these products in 1950, the biggest ap-

pliance sales year in history, totaled some 15,341,000 units.

"The trend should be up in 1957," Jeffrey said, "and the industry may well reach its 16-million-unit year."

PHILCO PURCHASES BENDIX HOME LAUNDRY

Philco Corp. has confirmed trade reports that it has purchased the Bendix home laundry equipment business of Avco Manufacturing Corp. in the U. S. and throughout the world, except in Canada. James S. Skinner, Jr., Philco president, said Philco has acquired the Bendix laundry trademarks, patents, tools and dies, foreign licenses, and current inventories of Bendix laundry equipment and parts. The transfer was made effective Nov. 30. Bendix washers and dryers will be marketed through Philco distributors and dealers.

At the same time, Skinner said a manufacturing agreement has been concluded with Avco under which Bendix laundry equipment and Philco electric ranges will be manufactured to Philco specifications in Avco's facilities at Nashville, Tenn. This arrangement will augment Philco's laundry equipment manufacturing operations at Philco's Dexter Division at Fairfield, Iowa.

The report suggests that many of the engineers and merchandising personnel who have been with Bendix Home Appliance Division for years are expected to join Philco.

The arrangement also provides that Philco will service existing Crosley products and Bendix home appliances.

With respect to Canada, Philco has entered into an agreement to furnish technical assistance to Moffats Limited of Canada, an Avco subsidiary, and to furnish products, parts, and components to Moffats for the production of refrigerators, freezers, washers, and dryers.

KELVINATOR REPORTS ON COLOR

The three most popular colors in Kelvinator's line of colored appliances during 1956 were pink, yellow, and turquoise, according to Homes L. Travis, vice president-sales.

The three colors represented 75 per cent of all colored appliance production, Travis told magazine and newspaper editors during a press preview of the new 1957 range and refrigerator lines.

Kelvinator first offered colored appliances two years ago with a choice of eight colors. For 1957 all Kelvinator models in refrigerators, as well as cer-

tain range models and automatic washers and dryers, are available in colors.

"In the two years Kelvinator has been making colored appliances, we have become more firmly convinced that color is here to stay, and will grow even more rapidly in popularity," Travis said.

For Kelvinator's fiscal year ending September 30, Bermuda pink accounted for 33.5 per cent of color production; buttercup yellow, slightly over 30 per cent; and turquoise, introduced as a new color only last year, totaled 10.5 per cent, Travis said. Three other colors, Spring green, lagoon blue, and sand biege, ranged from 6 to 7.5 per cent.

"Our experience with color has shown that color popularity moves according to trends. Currently the trend in color points to deeper tones. To satisfy the changing tastes of American homemakers, Kelvinator is introducing with 1957 models, two new colors, Autumn rose and village green.

1956 RECORD YEAR FOR HOME LAUNDRY APPLIANCE SALES

Record factory sales of home laundry appliances for 1956, amounting to approximately 6,227,000 washers, dryers, and ironers, a 9 per cent increase over 1955, were forecast at mid-December by Guenther Baumgart, executive director of the American Home Laundry Manufacturers' Association. The previous record sales year was 1955 when 5,700,000 units were sold.

Baumgart said that the industry's top market research analysts expect 1957 sales to increase to 6,425,000 units for the third consecutive peak sales year.

The growth in popularity of automatic clothes dryers was largely responsible for increased total unit sales, he noted. Clothes dryers increased by 18 per cent for the year, or approximately 256,000 units. Automatic washers increased 10 per cent by approximately 308,000 units.

Wringer type washer sales for 1956 are expected to approximate 1955 sales of 1,154,000 units.

YELLOW LEADS AS BATHROOM FIXTURE COLOR

Yellow bathroom fixtures have shown greater popularity growth in recent years than any other color, says the Plumbing Fixture Manufacturers' Assn.

For example, four times as many yellow bathtubs are now being sold as

were purchased three years ago when the color was introduced.

Second in percentage growth during the same period is gray. It is now three times as popular as in 1953. Pink or coral is third, slightly more than twice as popular, according to the PFMA.

Other colors making decided gains recently include tan, ivory, blue, and green, in that order. The percentage of total sales in white has slipped 15 per cent in three years, PFMA reports.

PEOPLE AND EVENTS

Cloud Wampler, chairman of the board of Carrier Corporation, has been named to another term as a board member of the National Industrial Conference Board. His re-election came at the board's 370th meeting held recently at the Ambassador hotel in New York City. Wampler was first elected to the board in 1947 for a one-year term, and has been renamed each successive year.

Promotion of *Richard Powell* to the position of general manager of the Clyde (Ohio) Division of Whirlpool-Seegeer Corp. was announced recently by *Donald W. Alexander*, vice president in charge of operations. Powell, formerly works manager at Clyde, succeeds *Robert L. Evans*, recently elected vice president in charge of personnel. *S. R. Burns*, who was previously director of quality control, has been appointed works manager to succeed Powell.

Norman Jenewein and *Donald W. Thomas*, both electrical engineers, have joined the engineering staff of Amana Refrigeration, Inc., Amana, Iowa, it was announced by *Francis A. Noll*, director of engineering.

Jenewein, an electrical engineer

formerly with Deepfreeze, now a division of Amana, has been named project engineer in refrigeration systems for Amana's new Deepfreeze chest freezers. Thomas has been appointed to Amana's engineer training program.

John F. Ovsik has been promoted to director of purchases for Vulcan Containers, Inc., Bellwood, Ill., according to *Vern I. McCarthy*, president.

As director of purchases, he is responsible for buying steel, paint, and other materials used in manufacturing pails and steel containers for 3,000 companies representing 25 industries.

Frank J. Gleason has been named president of Copeland Refrigeration Corp., Sidney, Ohio, it has been announced. He succeeds *Harry E. Thompson*. Gleason, former executive vice president since 1955, will continue as Copeland treasurer, a post he has held since 1937.

James R. Weaver, works manager at the East Springfield, Mass. plant of Westinghouse Electric Corp., has been elected chairman of the Research Fund Committee of the 35,000-member American Society of Tool Engineers. The announcement was made by *Howard C. McMillen*, ASTE national president.

Owen Kuhen has been named product specialist for Carrier Corporation's large-capacity absorption refrigeration equipment, according to an announcement by *Hermann C. Hoffmann*, general sales manager, Machinery and Systems Division. Kuhen's business career has been devoted to air conditioning using absorption cooling.

Charles E. Bulloch has been named to the newly created position of director of product development for the A. O. Smith Corp. He will report to Marketing Director *S. E. Wolkenheim*. In

making the announcement, Wolkenheim said, "Bulloch's duties will include exploring new product applications and markets, with particular emphasis on the field of glass fused to steel. In addition, he will be responsible for the integration of newly developed products into the corporation's existing production and marketing structures."

The board of directors of the A.O. Smith Corporation, Milwaukee, Wis., has elected three new officers of the company, it was announced by *L. B. Smith*, president.

Named as vice presidents were: *U. T. Kuechle*, who has been automotive general sales manager since 1954; and *Roy A. Dingman*, who joined the company in April, 1956, as director of industrial relations. *Robert A. Rietz* was named assistant secretary.

Frank H. Brown has been appointed production planning and material control manager of the Stamping Division, Chrysler Corp., Detroit, Mich., according to a report.

It is reported that *John R. Caulk, Jr.*, vice president for manufacturing, was elected to the new post of executive vice president, Hussmann Refrigerator Co., and *W. H. Vormehr*, former vice president of refrigeration production, succeeds Caulk as vice president for manufacturing.

Frank Fisher has joined the Harry C. Weiskittel Company, Baltimore, Md., (Real Heat Gas Ranges.) Fisher will be assistant to the president, in charge of national sales.

Two employees of The Maytag Company, Newton, Iowa, *Francis C. Wheeler* and *Gerald Doane*, have been promoted to general foremen in the company's toolroom and dryer assembly departments, respectively.

WAMPLER

POWELL

JENEWEIN

THOMAS

OVSIK



NEWS about Suppliers

US STEEL EXPANDS CAPACITY IN CHICAGO DISTRICT

Improvement of facilities to add over 1,300,000 ingot tons to the steelmaking capacity of U.S. Steel Chicago district plants, has been announced by Harvey B. Jordan, executive vice president, operations.

First announced by Board Chairman Roger M. Blough in Gary last March, the projects, which will lift the capacity of Gary Works to approximately 8,000,000 ingot tons and increase the capacity of South Works to almost 6,000,000 tons, comprise the initial expansion considered to be essential to national defense at these plants.

Expansion at Gary Works includes improvements to the open hearth shops which will add approximately 800,000 tons to its annual ingot capacity. At South Works, enlargement of furnaces and other improvements in the open hearth shops will increase capacity about 525,000 tons annually there.

At Gary Works, a new slabbing mill will be installed, and improvements to the 160" mill will add to Gary's plate capacity.

South Works' rolling mill improvements are geared to previously announced blooming and structural mills now being installed and scheduled for completion late next year.

HAFER OF REYNOLDS GIVES PAPER AT PARIS EXPOSITION

Richard F. Hafer, chief finishing engineer for the sales division of Reynolds Metals Co., Louisville, Ky., delivered a technical paper Nov. 22, at the International Industrial Exposition, Paris, on the subject "Surface Treatments For Aluminum And Their Use In American Architecture". The paper covered mechanical, chemical, anodic, and porcelain enamel finishing techniques for aluminum.

"Aluminum can be finished," the paper stated, "to provide a greater variety of surface textures and colors than any other metal. It becomes the most logical metal to satisfy the architect's

desire for color and contrast in building design. Surface treatments, therefore, become the basis of aluminum's bright and colorful future in American architecture."

PROCTOR ELECTRIC COMPANY EXPANDS BALTIMORE PLANT

Proctor Electric Company has increased manufacturing and warehousing facilities in its Maryland plant by 50,000 square feet, it was announced by Harvey E. Hortman, vice president in charge of Baltimore plant operations.

The resulting consolidation of facilities provides room for new production machinery in the Housewares Division, and also permits expansion of Proctor's Equipment Division which manufactures controls for electric ranges and similar appliances.

EAGLE-PICHER BUYS CHICAGO VITREOUS

Chicago Vitreous Corp., and Lusterlite Corp., an affiliated company, have approved the sale of all the assets and properties of both companies to the Eagle-Picher Co., Cincinnati, Ohio.

The Eagle-Picher Co., through five operating divisions, sells to a broad

cross-section of industrial companies, including manufacturers of: automobiles, steel, paint, building materials, farm equipment, and ceramics.

Chicago Vitreous Corp., founded in 1918, is an important producer of porcelain enameling frits. Its business is conducted by two divisions: 1) the Frit Division, which manufactures and sells porcelain enamel frits; and 2) the Architectural Division, which manufactures porcelain enameled steel panels for gasoline service stations erected by Lusterlite Corporation.

CARPENTER STEEL ADDS HOUSTON WAREHOUSE

A new mill-branch warehouse and office has been opened in Houston, Tex., by The Carpenter Steel Co. to provide sales and technical service to users of tool, stainless and alloy steels in Texas, Louisiana, Mississippi, and the Mobile, Ala., area. Charles E. Miller, recently appointed Houston branch manager, will be in charge of the warehouse. He will be assisted by John D. Wilson, sales representative.

US BORAX & CHEMICAL LEASES SPACE IN ROCKEFELLER CENTER

In a move to bring together the offices of its several divisions, United States Borax & Chemical Corporation has leased the 8th, and part of the 9th, floors at 50 Rockefeller Plaza, New York, N. Y. The offices will be the headquarters for the Pacific Coast Borax Company, and United States Potash Company Divisions, and the Eastern sales office of the 20 Mule Team Products Division. The offices are expected to be ready for occupancy about June 1.

LINK-BELT EXPANDS WEST COAST FACILITIES FOR CONVEYOR AND MATERIALS HANDLING SYSTEMS



Above is an architect's drawing of a new Link-Belt Co. plant to be built in Montebello, Calif., about 10 miles east of downtown Los Angeles, to replace and expand the company's facilities at

361 S. Anderson St., Los Angeles. Ground will be broken next spring and it is expected the plant will be completed and in operation by November, 1957.

METAL & THERMIT TO BUILD CHEMICAL PLANT IN KENTUCKY

Metal & Thermit Corporation, New York, large producer of tin chemicals, has purchased a 163-acre site near Carrollton, Ky., and will soon begin construction of a new chemical processing plant, according to an announcement by H. E. Martin, company president.

Products will include a complete line of color stabilizers for polyvinyl chloride resins and other plastics formulation. Other Metal & Thermit organic tin chemicals to be manufactured here are used as catalysts and stabilizers in a wide variety of chemicals and plastics products.

LINK-BELT ACQUIRES DETROIT SCREWDRIVER FIRM

Link-Belt Co., Chicago, has acquired Detroit Power Screwdriver Co., manufacturer of power-driven screwdrivers and related automated assembly equipment for industry. The announcement was made by Robert C. Becherer, Link-Belt president, and Roy W. Bailey, president of Detroit Power Screwdriver.

TEN PAINT FEDERATION GRANTS TO NORTH DAKOTA STUDENTS

Ten grants-in-aid, in the sum of \$250.00 each, have been awarded to ten chemistry students at North Dakota Agricultural College by the Federation of Paint and Varnish Production Clubs, technical association of the protective and decorative coatings industry.

This program is one of the Federation's activities in support of technical education, and the need of the paint industry for more technological personnel.

Other educational and research programs under the sponsorship of the Federation are now in progress at New York University, Case Institute of Technology, University of Louisville, Northeastern University, University of Missouri, and North Dakota Agricultural College.

CASTING INSTITUTE ELECTS OFFICERS AT MEET

New officers and directors have been elected by the Investment Casting Institute at its fourth annual meeting at the Sheraton-Cadillac hotel, Detroit, Mich. Those elected are: K. W. Thompson, president of the K. W. Thompson Tool Co., New Hyde Park, L. I., New York, president; F. W. Schipper, man-

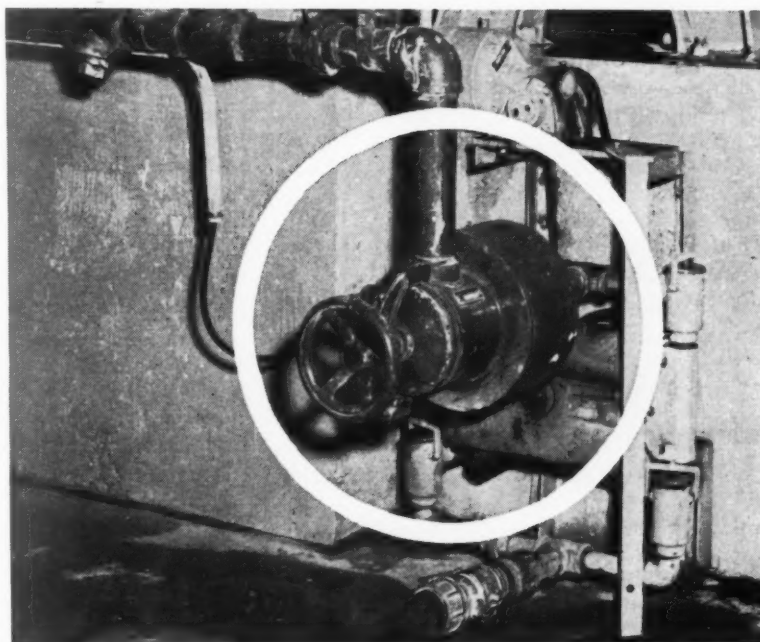
ager of the Investment Casting Division of the Howard Foundry Co., Milwaukee, Wis., vice president; and V. S. Lazzara, president of Casting Engineers, Inc., Chicago, treasurer. Directors for the coming two-year term include C. R. Whittemore, chief metallurgist, Deloro Smelting & Refining Co., Deloro, Ont., Can., and R. C. Kramer, assistant sales manager, Kolcast Industries, Inc., Cleveland, Ohio. Filling a one-year directorship is V. S. Lazzara, newly-elected treasurer and retiring president of the Institute.

NORGE DEALER RANKS EXPAND

More than 1,600 new dealers were signed by Norge Division, Borg-Warner Corp., Chicago, during August and September.

ICI SALES REACH \$160,000,000

Sales of the Investment Casting Industry, the method by which intricate patterns and forms are made for the manufacture of precision parts for the aircraft, automotive, electronics, and



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various other industries, are estimated at \$160,000,000 for 1956, according to Frank W. Glaser, executive vice president and general manager of Alloy Precision Castings Company, Cleveland, Ohio. This is a considerable increase over 1955, when sales amounted to \$135,000,000.

ARGONNE NAT. LAB. TO HOST MEMBERS OF MEC

The Argonne National Laboratory will be the site of a plant tour, to be attended by members of the Midwest Enamellers Club on Friday, January 25, 1957. The laboratory is located one and one-half miles southwest of Route 83 on Route 66, near Lemont, Ill., a Chicago suburb, and the main entrance to the reservation is on Bailey Rd. To gain admission to the laboratory, visitors must be United States citizens, and those attending will meet at the cafeteria at 1:30 PM. Among the things to be seen will be a test reactor, a cage of hot materials, pilot plant metallurgy use of radio active materials, a ceramic laboratory, and non-destructive testing.

PEOPLE

Appointment of Miss Patricia Hendrick as home service director of the Harper-Wyman Co. has been announced by Philip S. Harper, Jr., executive vice president. Miss Hendrick will supervise the operation of a fully-equipped test kitchen in the general offices in Chicago.

Everett A. Sisson has been appointed director of sales of The Patterson Foundry and Machine Company, East Liverpool, Ohio, according to C. W. Gerster, president. Prior to his joining Patterson, Sisson was sales manager of The Osborn Manufacturing Company, Cleveland. He is a member of the American Management Association and the National Sales Executive Assn.

Ben F. Edman, Evanston, Ill., has been named sales manager for Refrigerator and Appliance Finishes for The Arco Company, Cleveland, Ohio, according to a company announcement. Edman brings to The Arco Company a background of experience in original equipment finishes, including ten years experience with the Nubian Division of The Glidden Company, in research, technical service, and sales capacities.

Sylvester N. Smith, Chicago district manager of Ferro Corporation, has been transferred to the corporation's main office in Cleveland, Ohio; where he will assume the duties of manager of customer service. From 1941 to 1945 Smith managed Ferro's Birmingham, Ala., war plant. In 1945 he became Ferro's district manager in Michigan, and followed this by moving to Chicago in 1953 to serve in the same capacity.

Edward A. Miller has been appointed district manager, filling the position made vacant by Smith's transfer. He will assume responsibility for the sale of Ferro enamel and glaze frits, as well as colors for enamels, glazes, and plastics. The announcement came from Ferro Headquarters in Cleveland.

Paul A. Benke has been appointed vice president and general manager of Paasche Airbrush Company, a division of Cline Electric Manufacturing Company, Chicago. The announcement was made at the Paasche Annual Sales Conference by Warren P. Scott, president of the Cline firm.

David F. Austin, executive vice president-commercial, United States Steel Corporation, retired on December 31 after nearly 39 years of service. Announcement came from Clifford F. Hood, president of the corporation. At the same time, Hood announced that Austin's successor will be Richard F. Sentner, presently assistant executive vice president-commercial.

Hanson-Van Winkle-Munning Co. recently announced the appointment of Gerald F. Turek as a sales representative in the company's Milwaukee territory. This includes the states of Minnesota, Wisconsin, and North and South Dakota.

Keith Hall has been named director of industrial markets by Reynolds Metals Company, according to an announcement from the aluminum firm's sales headquarters. The position involves formulation and direction of sales programs and policies for the large number of industrial markets for aluminum.

The appointment of Bernard S. Reckseit as chief engineer is announced by Ransohoff, Inc., Hamilton, Ohio, manufacturer of metal cleaning and finishing equipment and systems. He is a registered professional engineer with background in the design of metal cleaning and finishing equipment. Reckseit is active in The American Society of Mechanical Engineers and The Cincinnati Engineering Society.

Henry F. Dever, president of Brown Instruments Division of Minneapolis-Honeywell, has been given corporate responsibility for directing the parent company's activities in the industrial controls field, Paul B. Wishart, president of Honeywell, announced recently.

Dever will be responsible for the over-all planning in the industrial controls field, and will counsel and coordinate the engineering and manufacturing operations of seven M-H divisions now active in this field, Wishart said.

J. L. Mauthe has been elected chairman of the board of The Youngstown Sheet and Tube Co. A. S. Glossbrenner, former vice president of operations, has been elected president, succeeding Mauthe. Walter E. Watson, former first vice president, has been elected vice chairman of the board.

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HENDRICK



SISSON



EDMAN



SMITH



MILLER



BENKE



BEHR-MANNING DEMONSTRATES NEW TECHNIQUES IN FINISHING; PRODUCTION MEN BRING ACTUAL WORKPIECES FOR ABRASIVE TESTS

The Second National Metal Finishing Show, concluding Nov. 2, '56 at the clinic rooms of the Behr-Manning Company's Cleveland, Ohio plant, unfolded some significant new techniques in coated abrasive grinding and finishing of metals. Purpose of the exhibit was to provide a clearing house of information and education on the many new developments in a rapidly expanding technology.

Consisting of nearly 100 machine tools and metalworking machines, most of them developed within the past two years, and some shown here for the first time, the exhibit demonstrated the various phases of metal finishing beginning with the use of small belt polishers

being lapped or polished are thus brought to bear against compounds or cloths of various combinations placed in the pan, and the vibratory motion of the pan provides the abrasive action by which the parts are finished.

An estimated 3,000 production men from all phases of the metalworking industry, and from all parts of the country, attended the show. The first day was devoted exclusively to editors of the metalworking and business press. Throughout the remainder of the week, the show was open to industrial production men. Representatives from several West Coast aircraft plants were present to observe the latest methods in grinding and finishing aircraft and engine components, and abrasives technicians from



Air-powered disc sander, revolving a 9-inch coated abrasive disc, polishes draw marks from drawn steel tub.

Oscillating polisher, designed to finish out-of-round parts, is actuated by air cylinder, timer arrangement.



designed for off-hand roughing and polishing contoured parts such as small jet engine blades, on up to huge multiple-head conveyor-type belt grinders designed for high-volume flat surfacing of ferrous and non-ferrous metals, glass, plastics, ceramics, etc. Small, portable hand sanders and polishers, both air and electric types, were much in evidence for cleaning up welds, deburring castings, stock removal.

Interesting in the lapping and polishing field was a vibratory machine which can lap or polish metallurgical samples, metallic sealing ring bases, and other metal parts in quantities. Working on the principle of electromagnetic vibration, the parts move around the periphery of a flat, circular pan on which they are placed, with pressure applied from above through the use of a heavy metal cover. The underside of the parts

one of the largest automotive companies attended the demonstrations. Behr-Manning scientists and engineers were on hand to give lectures and demonstrations, and representatives of machinery manufacturers were present to explain the latest methods employed in the coated abrasive grinding and finishing field. A highlight of the show was a color film on the uses of abrasive discs in metalworking.

E. C. Schacht, president of Behr-Manning, in touching upon some of the interesting sidelights of his career with the company, recalled that someone had referred to him as a "sandpaper salesman" back in 1925 when the company manufactured that type of abrasive only. The firm, a division of Norton Co., has its main office and plant at Troy, N. Y., and manufactures coated abrasives for every grinding and finishing application.

SUPPLIER PERSONALS CONTINUED

Ernest M. Hommel, president of the O. Hommel Co., announces the appointment of *Harry Lee Barker* to the sales and service staff of the company's Pottery Frit and Color Division.

The general manager of sales for the Sharon Steel Corp., *W. J. McCune*, announced the appointment of *James C. Holway* to a position in the corporation's market research department.

F. John Pichard has been advanced to the post of manager, standard equipment sales, at Wheelabrator Corp., Mishawaka, Ind.

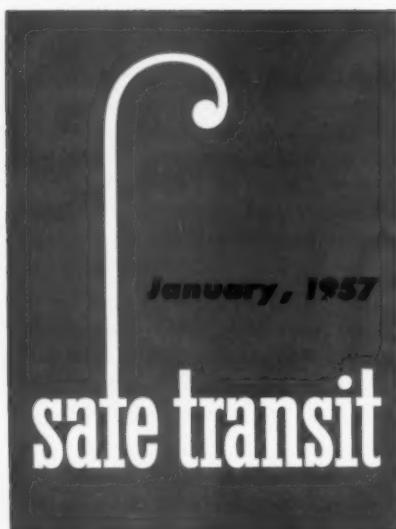
Solar Steel Corporation's general offices in Cleveland, Ohio announced that *Donald J. Hartman* has been named assistant plant manager, and *Elmer Froehlich, Jr.*, has been made assistant sales manager at Solar's flat rolled products plant in River Rouge, Mich.

Ford Ballantyne, Jr., a Wyandotte Chemicals vice president, and general manager of the J. B. Ford Division, has announced the appointment of *Harold R. Suter* as technical director of this division of the corporation. Suter will coordinate the activities of Ford Division research, technical service, and manufacturing and engineering departments, the announcement states.

Errett M. Grable, president of Wear-Ever International, Inc., Aluminum Co. of America subsidiary, has been elected to the board of directors of Firth Sterling, Inc., it was announced by Firth Sterling president *Kenneth D. Mann*.

The appointment of *Thomas G. Cleghorn*, St. Petersburg, Fla., to the porcelain enamel frit sales and service staff of the O. Hommel Company is announced by *E. M. Hommel*, president. Cleghorn is being assigned to the company's southern division and will be headquartered in the Louisville, Ky. area.

Bland B. Button was appointed vice president to direct sales of specialized chemicals to metals processing industries. He succeeds *W. E. Noyes*, who will continue as manager of South American operations, and will serve as a special consultant.



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 York Street at Park Avenue
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editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

here is a review of the problem; the answers developed through cooperative effort; and the six resulting benefits received . . . a special report on . . .

The one thing American industry forgot on the to

by *R. F. Bisbee* • GENERAL CHAIRMAN, NATIONAL SAFE TRANSIT COMMITTEE

ON the high road to achievement, American industry forgot one thing. We learned early the economy of mass production and the benefits of *standardization* which together have enabled us to attain the highest standard of living ever known to man. But one stone was left unturned.

We learned how to make and sell products cheaply enough that millions could buy. And we constantly improved our products. We learned quickly the value of *standardization*; its role in forcing competing companies to bring us better products at lower cost. We soon learned that the benefits of standardization accrued to both consumer and producer.

What of the unturned stone?

With all the standardization in the *making* of products, American industry forgot to apply the same principle to the *safe arrival* of these products in the market place . . . or the home.

For many years . . . or until a scant eight years ago . . . there was no standard, uniform test for American packaged products that would assure their safe arrival in the market place. Each manu-

facturer had his own test system and his products were packaged with either too much or too little protection. Even laboratories specializing in packaging were not in a fair competitive position. No



standard test had been devised. A packaged product that would pass one set of requirements might fail woefully with another set. One laboratory might be quoting on more than enough packaging, while another based its costs on insufficient packaging.

But that is all changed now. American industry has remembered the story of standardization. It took the formation, in August 1948, of the National Safe Transit Committee to remind American industry of the absolute necessity of a standard pre-shipping test for packaged products. Typically American, the test is simple, but effective.

National safe transit program

What is the National Transit Program?

It is simply a cooperative effort to expand the use of *Standard* pre-shipping tests to assure that packaged products will withstand normal handling of their journey from the production line to the consumer. The basic objective of the National Safe Transit Committee is to attain widespread use of its practical testing program by manufacturers and

thus reduce losses resulting from damaged products.

Who's who in industry

And now that American industry has remembered the story of standardization; has now applied its principles to shipping tests for its product as well as to their manufacture, what has happened? More than 250 companies and 55 laboratories have adopted the NST program, have become "certified." The list of shippers and carriers reads like an American "Who's Who" in industry. The leading associations representing the manufacturers of household appliances and allied products are backing NST. The principal associations representing container manufacturers, the National Industrial Traffic League, the American Standards Association and others are doing likewise. On the carrier side, Association of American Railroads, American Trucking Association, Railway Express and Air Cargo are NST backers.

Through NST effort both shipper and carrier are now cooperating to reduce losses through damage to products in transit. On the carrier side is a concerted effort in the form of constantly improving handling methods, education of personnel and the use and proper maintenance of equipment. For the shipper, NST is a two-edged sword for cost cutting. The *standard* pre-shipping tests of

as he sees fit. NST's only aim is to reduce shipping losses through standard pre-shipping tests. The development of these tests and the exchange of information among shippers and carriers have been and will continue to be the function of the National Safe Transit Committee. In its published statement of policy, NSTC says:

Results of program

"If you will test your packaged products by these procedures, experience has shown that your loss and damage and your packaging costs will be acceptable minimums. It is up to each shipper to decide whether or not he will use these test procedures. The program is entirely voluntary and implies no connection with tariffs, freight rates, claim procedures or any other existing transit regulations."

The NST Label

What is the National Safe Transit Label?

This bright red and yellow label is both the emblem of the National Safe Transit Committee and the symbol of safe shipping.

Certified manufacturers are privileged to place this label on their packaged products.

Telling a story in itself, the label proclaims - - - "The manufacturer certifies that his packaged product meets the pre-shipment testing standards established by the National Safe Transit Committee and will withstand normal transportation and handling hazards." In the red panel is the bold-faced type message - - - "PRE-TESTED SAFE TRANSIT SHIPMENT . . . MAKE SAFE HANDLING YOUR JOB."

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LABEL PRINTS ON YELLOW

NST will assure him that his packaging costs and shipment losses will be held to the barest minimum.

Better product design—packaging

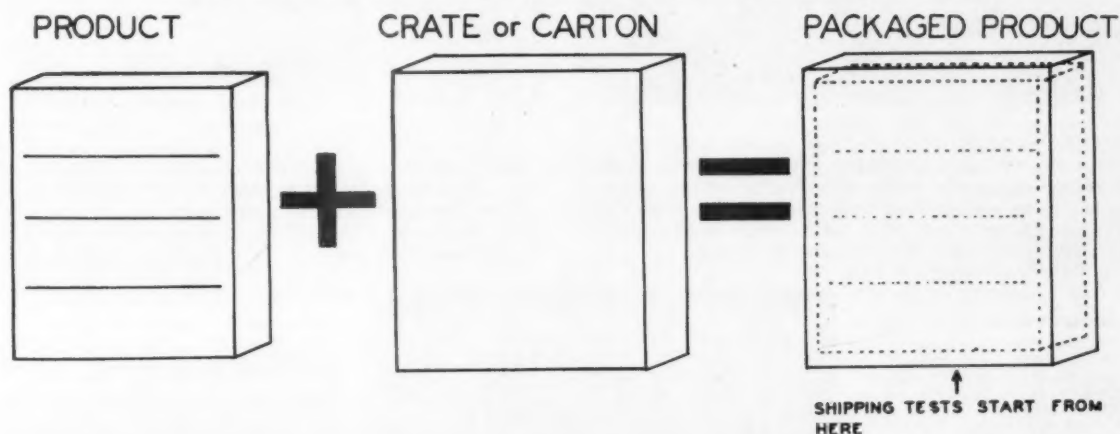
Sometimes the manufacturer has found that better design of his product was the answer as shown by the standard pre-shipping test. Sometimes, it was the design of his package. But whatever it was, the decision was up to him for NST in no way encroaches on the manufacturer's right to design and produce

For a typical example of their enthusiasm, I quote from a speech made by John M. Miller, Executive Secretary, ATA National Freight Claims Council:

"The National Safe Transit Program undoubtedly represents the greatest contribution of the reduction of transportation damage which we will see in our generation."

Certified laboratories are now on an equal basis. The NST tests are their standard and they can all "measure with the same rule," so to speak.

THIS IS THE KEY TO THE SUCCESS OF THE NATIONAL SAFE TRANSIT PROGRAM



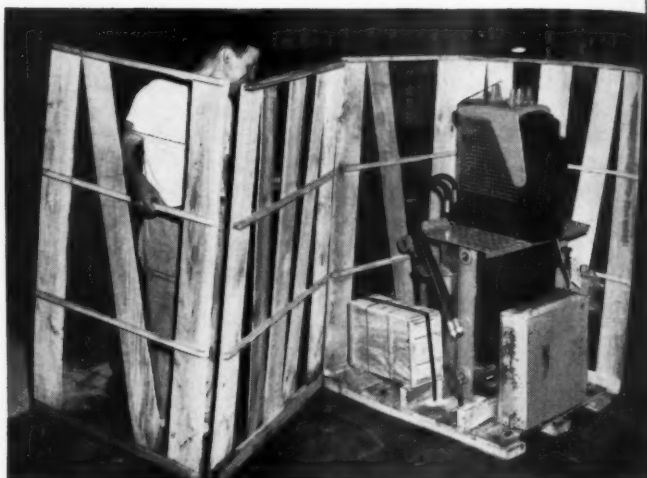
PACKING



FROM WIREBOUND



Corn Shellers Get Shell. Now, a Wirebound pack provides a protective export shell for two corn shellers. By bolting one to the top and the other to the bottom of the Wirebound, interior packing is eliminated and packing time reduced from 1½ hours to 48 minutes. Gross shipping weight is cut from 353 pounds to 319 pounds; packing cost reduced by 41%.



Wirebound Provides "All-In-One" Pack For Diesel Tractor Attachment Assembly. A multiple part tank assembly for a heavy duty model power digger attachment for a diesel tractor ships all in one compact Wirebound crate. And this Wirebound container accounts for only 154 of the 1307 pounds of gross shipping weight as well.



Accounting Machine Gets Money Saving Protection. An intricate and delicate accounting machine mounted on rubber shock mounts and dust-protected with plastic bag wrappers is solidly enclosed by a Wirebound Box for maximum protection in domestic or export shipment. All four models of this machine pack with equal safety in this one container thus saving time, labor and over-all shipping cost.



4 Minute Packaging For Porcelain Enameled Bathtubs. Enameled steel bathtubs for mobile homes are now packed in only four man-minutes. This fast work allows big economies in packing costs, yet the Wirebound crates that do the job provide the finest protection possible for the fragile product. The Wirebounds also allow easy inspection at all times and simple fall-away unpacking.

FREE important advantages like these can be yours... write today for your copy of this informative booklet "What to Expect From Wirebounds". It is loaded with problem solving Wirebound applications. Better yet, talk over your requirements with a Wirebound Sales Engineer. Write us for either the book or the man.



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ASSOCIATION**

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THERE'S ALWAYS SOMETHING NEW IN WIREBOUNDS

INDUSTRY FORGOT CONTINUED

The label is designed to carry the message of pre-shipment testing directly to handling personnel.

Carrier recognition is one of the major benefits to the manufacturer using the label. The splendid spirit of cooperation and teamwork between carriers and industry has been one of the reasons for the success of the National Safe Transit Program since its beginning.

The "two-way street"

The manufacturer who uses the label shows he is doing his part in the "two-way street;" therefore, the carriers in this cooperative program have pledged themselves to the effect: "If a manufacturer cares enough to pre-test his packaged products and use the National Safe Transit label to proclaim that he is doing his part in the National Safe Transit Program, we will handle with more care those packaged products which bear this label."

As a good will ambassador --- the label is designed to improve handling of packaged products in transit, and thus further reduce damages. It soon became evident that this was not its only role. Consignees were quick to grasp that the manufacturer using the label had literally done everything possible to assure safe delivery of the product.

Program catches on

The recognition grew out of the continuing and intensive educational programs of the National Safe Transit Committee and other cooperating groups. Manufacturers began to see the label building good customer relations and increasing sales.

It is not just another "FRAGILE" label available for the purchasing --- only companies certified under the National Safe Transit Program are permitted to use the label --- then only on packaged products meeting the pre-shipment test requirements of the National Safe Transit Committee. More and more companies are making the label an important part of their sales and public relations programs.

Sales and public relations

Here's what one certified company recently told approximately 500 industrial supply distributors located throughout the country:

"We are pleased to tell you that our company has been certified by the National Safe Transit Com-

mittee. Such certification enables us to display the "Safe Transit" label on our packages. Look for these labels on our packages. They are your assurance that our products are being shipped for safe arrival."

Label is sales aid

The label is a vital sales aid --- a definite sales advantage when customers are shown that pre-shipment testing saves them the trouble and expense of handling damaged goods. One certified manufacturer received a letter from a large distributor handling their merchandise, saying:

tested in accordance with the NST pre-shipment tests. This he can do at a certified laboratory, or in his plant. But the sampling must be sufficient to indicate that at least one line of his packaged products has met the prescribed tests. He has then to notify the National Safe Transit Committee at 1145 Nineteenth St. N. W., Washington 6, D. C. The NSTC will then forward a "Manufacturer's Application" form for completion and return. On receipt of this application, along with the Safe Transit Laboratory report, the NSTC will take action to certify the company. Qualifying companies then receive the Safe Transit Certificate of participation.



PACKAGED PRODUCT TESTING has resulted in great advancements in the understanding of packaging technique, as well as the need for product design with the thought in mind of the need for their safe arrival to the customer. Here, one well known manufacturer's packaged product is given the shaker test, one of the special tests set up under the NST program to provide a quality control check on products and their packages as a single entity.

"It goes without saying that the independent distributors are going to think a long time before they purchase merchandise and appliances from those manufacturers who are not sufficiently interested in their product to cooperate in this program."

Use of the label

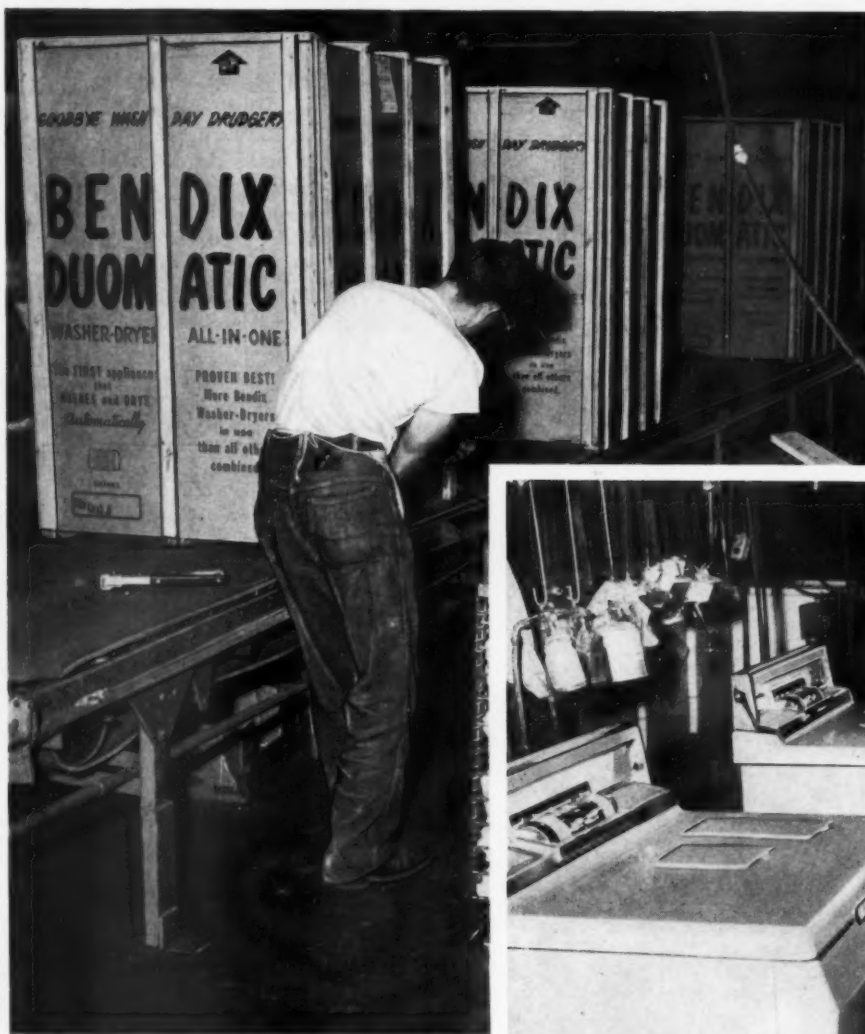
Briefly, use of the label is a must for those manufacturers who wish to reap the full benefits of this *standardized* program.

What does a manufacturers do to become "certified?" He merely arranges to have one of his packaged products

As it hangs on the manufacturer's wall, the Safe Transit Certificate is evidence of pride and profit. It is evidence that the manufacturer thinks enough of his products to assure their safe transit to the market place. It is evidence that he is reaping the following six benefits all of which aid in increasing profits:

1. **REDUCED PRODUCT LOSSES IN TRANSIT.** The manufacturer knows before his product is shipped that it is so designed and so packaged that it will withstand normal handling and transportation.
2. **REDUCED PACKING COSTS.** With guesswork eliminated, extra packaging is no longer necessary.

to Page 95 →



These Philco-Bendix Duomatic washer-dryers are properly protected for safe shipment through the use of Watkins Containers built by Hemb & Martin Mfg. Company.



The Finest Products Go In Watkins Containers

They are preferred because of:

1. Low Cost
2. Stacking Strength
3. 75% Assembled—Upon Receipt
4. Ease of Assembly
5. Easy Handling
6. Minimum Storage Space
7. Protection from Dust and Dirt

THESE COMPANIES BUILD WATKINS CONTAINERS

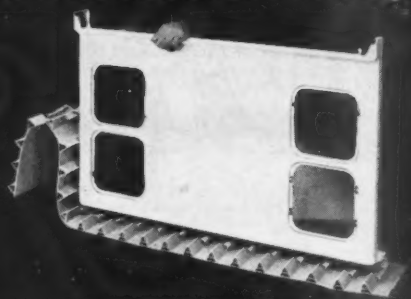


Custom Protection . . .

THE WATKINS CONTAINER MANUFACTURERS

COZIER CONTAINER CORP.
446 East 131st Street, Cleveland, Ohio
CRATE-RITE MFG. CO.
1015 Orient Street, Oakland 7, California
DURA-CRATES, INC.
940 E. Michigan St., Indianapolis, Ind.
HEMB & MARTIN MFG. CO.
P.O. Box 108, Murfreesboro, Tennessee
ILLINOIS BOX & CRATE CO.
811 Center Street, Plainfield, Illinois
KIECKHEFER BOX & LUMBER CO.
1711 W. Canal St., Milwaukee 3, Wis.
LEWISBURG CONTAINER CO.
242 Shaw Street, Lewisburg, Ohio
LOVE MFG. CO.
P.O. Box 546, Wichita, Kansas
UTILITY CRATE CORPORATION
2019 Imperial St., Los Angeles 21, Cal.

SUS-RAP PROVIDES SAFE TRANSIT and Economical Packaging



Exclusive **Vertical-Horizontal** suspension safeguards your product both in and out of its shipping carton. Fewer packaging components and the elimination of pad folding reduce labor and material costs.

SUS-RAP is engineered to your product and pretested by N.S.T. procedures

SUS-RAP

Laboratory Developed and Tested Packaging

VANANT COMPANY, INC. 954 S. Water Street Milwaukee 4, Wis.



O. A. SUTTON's 500,000th NST STICKER

The scene above represents the half million mark in appliances shipped from the O. A. Sutton Corp., Wichita, Kan., since they inaugurated the National Safe Transit Committee recommendations for safe transit operations. Proud that they have produced a half million appliances with the NST label on the shipping container, Sutton Vice President, Sales, Al Bross reported, "Dealer acceptance of our products is greater when the shipping container carries the NST label. They know this means that the product will reach the customer in perfect condition." In the photo above, Packaging Group Leader Charles Hale applies the 500,000th familiar red and yellow label as, Left to right, D. J. Mull, vice president-engineering; Jack Kuhlmann, Production Supt.; R. B. Cordes, Director of Quality; and C. H. Van Loon, manager of shipping and receiving, look on. L. W. Schmucker, not shown, is packaging engineer for the Kansas producer of Vornado appliances.

INDUSTRY FORGOT CONTINUED

Minimum requirements for the safe delivery of the packaged product are determined in advance.

3. **BETTER QUALITY CONTROL.** Establishing a periodical pre-shipment testing schedule will enable a manufacturer to maintain uniform quality of his product and package.
4. **MORE EFFECTIVE DESIGN.** Design engineers can pre-check new designs and construction features for "shippability" before recommending the new features for production.
5. **IMPROVE CARRIER, DISTRIBUTOR AND DEALER RELATIONS.** Carriers, distributors and dealers recognize the Safe Transit participant as a manufacturer who has done his part to assure the safe delivery of his product.
6. **BETTER CUSTOMER RELATIONS.** A manufacturer has a sales advantage when his customers are shown that pre-shipment testing saves them the trouble and expense of handling damaged goods.

TO TOP MANAGEMENT, ALL OF THESE BENEFITS ADD UP TO ONE THING --- PROFIT!

finish JANUARY • 1957

The Safe Transit Certificate is evidence also that the manufacturer who displays it is one segment of American industry which has not forgotten the importance of *STANDARDIZATION*; its benefits to both producer and consumer in helping build our high standard of living.

MAYTAG'S THOMPSON RETIRES

R. H. Thompson retired as general traffic manager of The Maytag Company, Newton, Iowa, effective December 31, 1956 because at the general election on November 6, 1956 he was elected a commissioner on the Iowa State Commerce Commission and will take office in Des Moines, Iowa on January 3, 1957. At Maytag he has been in charge of the Traffic Department for 31 years and would have reached normal retirement September 30, 1957.

Mr. Thompson is founder and first president of the Middlewest Shipper-Motor Carrier Conference; past president of the Newton Rotary Club; past president of the Iowa Industrial Traffic League; past regional vice president (Western Trunk Line Region) of the National Industrial Traffic League; past chairman of the Traffic Committee of the American Home Laundry Manufacturers Association; a member of the

General Traffic Committee of the Gas Appliance Manufacturers Association and presently chairman of a special



NST PARTICIPATION AT MAYTAG was heralded by Thompson, who is shown here, at right, watching as a new '57 model gets its red and yellow label.

Range Committee of the GAMA group and regional vice chairman of the Motor Carrier Rate and Classification Committee of the National Industrial Traffic League. He has been a registered practitioner authorized to practice before the Interstate Commerce Commission since February 13, 1944.

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Customer Service YORK ST. AT PARK AVE., ELMHURST, ILLINOIS

"I saw your ad in finish"

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HELP WANTED

PAINT FORMULATOR WANTED — What could be more interesting in the industrial finishing field than working with the huge automotive firms. If you are at present a formulator, you can be a part of this fascinating industry. We can teach you automotive pigmentation and formulation which will enable you to become a vital cog in the development of the beautiful exterior finishes appearing on the new cars today. This knowledge will open new avenues for advancement and increase your earning power. Salary open. Call or write C. E. Wurst, Jones-Dabney Company, 1700 Caniff, Detroit 12, Michigan, Townsend 8-2750.

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SPECIFICATIONS FOR WHITE APPLIANCE FINISHES by Edward G. Bobalek, Professor of Chemical Engineering, Case Institute of Technology. Four pages—two color. Critical problems in testing discussed, procedures and pitfalls pointed out and explained in this report which is of interest to all organic finish users. 15¢ per copy.

FORMABILITY OF METALS by Lester F. Spencer, Consultant in Metallurgy. Sixteen pages—two color. Covers: basic characteristics of metals, the carbon steels, press operations and roll forming. 25¢ per copy.

Please send all orders plus remittance to: Customer Service Dept., Dana Chase Publications, York St. at Park Ave., Elmhurst, Illinois.

INLAND STEEL INCREASES EDUCATIONAL GRANTS

Educational grants for 1956 by Inland Steel Company and its subsidiaries and divisions will amount to \$319,950, an increase of \$108,000 or 50 per cent, as compared with 1955, it was announced. Gifts are made through the Inland Steel Foundation and the Joseph T. Ryerson Foundation.

Leigh B. Block, vice president of Inland and president of its foundation, emphasized in making the announcement that the major portion of the grants were given to private institutions of higher learning, including voluntary aid to those public institutions that do not have access to tax revenues.

Included in the grants were fellowships of \$3,600 a year, established at Carnegie Institute of Technology, Purdue University, the University of Illinois, and the University of Wisconsin for graduate study in metallurgy. Recipients of the fellowships are to receive \$2,400 and the institution \$1,200.

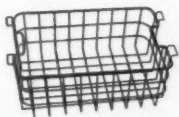
ONLY WIRE CAN DO SO MANY JOBS SO WELL!



FREEZERS



Refrigerator-Freezer Basket



Freezer-Storage Basket



Swing-out Baskets



RANGES



Oven Heating Element



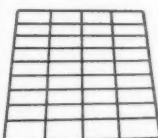
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Oven Rack Side Frame



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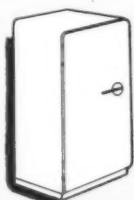
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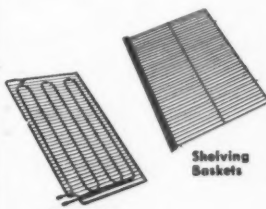
Glass Racks



Wire Forms of All Types



REFRIGERATORS UPRIGHT-FREEZERS



Evaporators Condensers

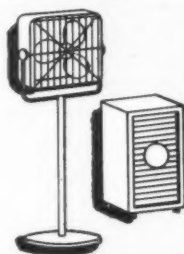


Shelving Baskets

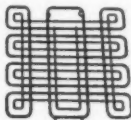
Ice Tray Racks



Bulb Guards



ROOM COOLERS VENTILATING FANS DEHUMIDIFIERS



Grills



Vents



Trivets



Special Sections

Wire is an important and functional "part of the product" in every American appliance. Wire is the preferred material because of its engineering, manufacturing and styling versatility, its strength, its lasting beauty and sound dependability. Wire... welded in the desired shape and size—plated in the finish required, is basically essential to the appeal, the sale and the continued satisfaction of your appliance.

And... if you are designing new appliances or reviewing current production, why not select the one manufacturer who has specialized in producing quality welded wire products for over half a century? Specify Union Steel... the experienced source that guarantees higher quality in every operational phase—plus on time delivery.

Union Steel's engineers will be happy to assist you in planning and producing a welded wire part or assembly that will make your appliance—or product—even more efficient. Why not call them now?

UNION STEEL PRODUCTS CO.

ALBION, MICHIGAN



Gentlemen: Please assist us, without obligation, with your suggestions for the use of fabricated and finished wire in our product.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

☐ Please have a USP representative contact us at once. We are interested in _____

SORENG STANDARD SNAPAC SWITCHES



OFFER YOU ✓ **RUGGEDNESS**
 ✓ **DEPENDABILITY**
 ✓ **HIGH CAPACITY**
 ✓ **ECONOMY**

USED BY MAJOR MANUFACTURERS FOR OVER 4 YEARS

The Soreng SNAPAC line is designed to provide rugged, dependable switches for the broadest range of snap action switch applications . . . at a realistic cost. The features listed define the characteristics of long life inherent in SNAPAC Switches. For complete information, we suggest you consult with a Soreng engineer or write for technical literature.

Electro-mechanical Features

- Instantaneous, positive make and break action
- High contact pressure
- Non-sensitive to vibration and shock
- Stable under momentary high overload
- Available S P S T normally open or closed, or S P D T

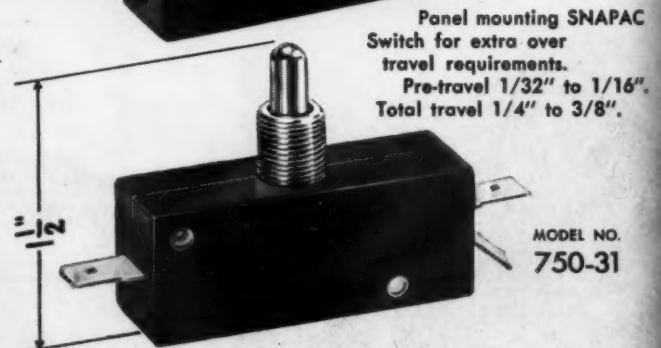
Rating:

15 amp 125 V. A.C.
 10 amp 250 V. A.C.
 1/2 h.p. 125/250 V. A.C.
 Listed by Underwriter's Laboratories

MODEL NO.
750-11

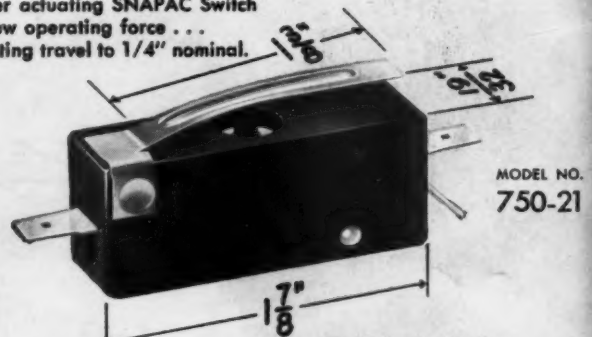


SNAPAC pin plunger switch operates within 1/32" to 1/16" pre-travel. Total 3/32" to 1/8".



Panel mounting SNAPAC Switch for extra over travel requirements. Pre-travel 1/32" to 1/16". Total travel 1/4" to 3/8".

Lever actuating SNAPAC Switch for low operating force . . . operating travel to 1/4" nominal.



MODEL NO.
750-21

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9559 SORENG AVENUE • SCHILLER PARK, ILLINOIS

Controls—for Modern Automatic Equipment



